SERVICE MANUAL

FISHER

LW/MW/FM STEREO SYNTHESIZER TUNER

FM-891
(EUROPE)

125 962 42

This service manual is prepared for Model FM-891. As only the components in the chart below differ, refer to the service manual FM-890 (WM-17160) for other components.

Ref. No.	FM-890	FM-891	Description	Q'ty	Remark
	PACKAGE 3-9415-10300		Bag Polyethylene	1	
	131-6-1169-16823	131-6-1169-16837	Box Corrugate-Exp.	1	
	131-6-9459-00300		Rubber Band	1	
	ACCESSORIES 142-6-4119-32890	142-6-4119-33425	Explanatory Booklet	1	
1	**CABINET** 131-2-1601-85203	131-2-1601-85209	Knob (Power)	1	
5	141-0-1129-17901 141-2-1129-39701 141-2-1449-61246 141-2-1449-70701	141-0-1129-17902 141-2-1129-39702 141-2-1449-61298 141-2-1449-70702	Cabinet Front Assy Cabinet Front Plate Front Plate Decorate	1 1 1 1	
12	141-2-1219-36402	141-2-1219-36404	Panel Rear	1	

Add this sheet to the Model FM-890 Service Manual (WM-17160).

REFERENCE No. WM-19685

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FM-890

LW/MW/FM Stereo Synthesizer Tuner

(EUROPE)

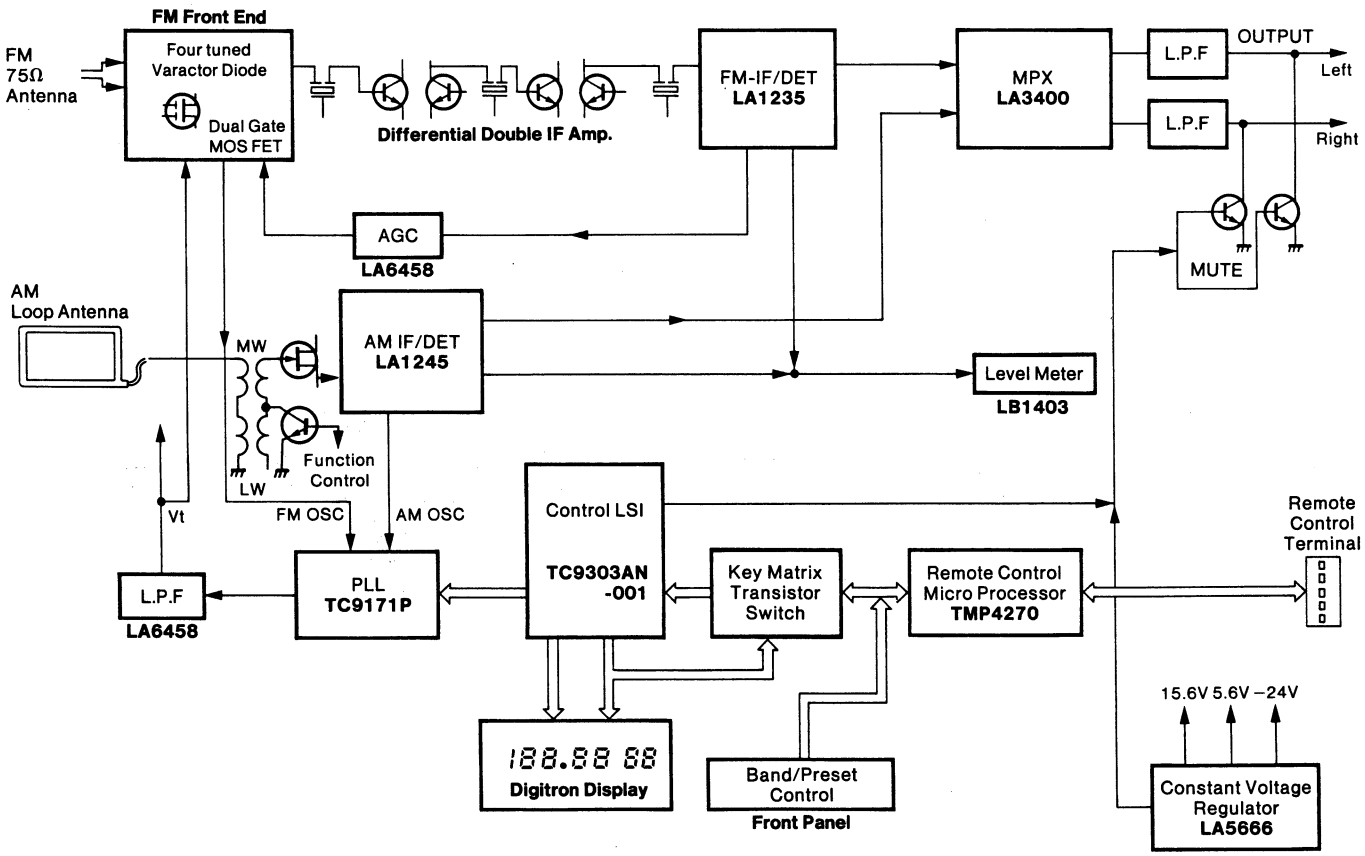
125 962 40

WM-1716

CONTENTS

Functional Block Diagram 2
Specifications 3
Cabinet & Chassis Exploded View 4
Cabinet & Chassis Parts List 5
Tuner P.C.Board Layout Alignment Points (Top View) 6
AM Tuner Alignment 7
FM Tuner Alignment 8
IC Equivalent Circuit & Block Diagram 9,10,11,12,13
P.C.Board Parts List 14,15,16,17,18
Preset Switch P.C.Board (Bottom View) 19
Antenna P.C.Board (Bottom View) 19
Remote Control Input P.C.Board (Bottom View) 19
Band Switch P.C.Board (Bottom View) 20
Meter LED P.C.Board (Bottom View) 20
Power Switch P.C.Board (Bottom View) 20
Schematic Diagram 21,22
Tuner Printed Circuit Board (Bottom View) 23,24
Front End Schematic Diagram 25
Semiconductor Lead Identification 26,27

FUNCTIONAL BLOCK DIAGRAM

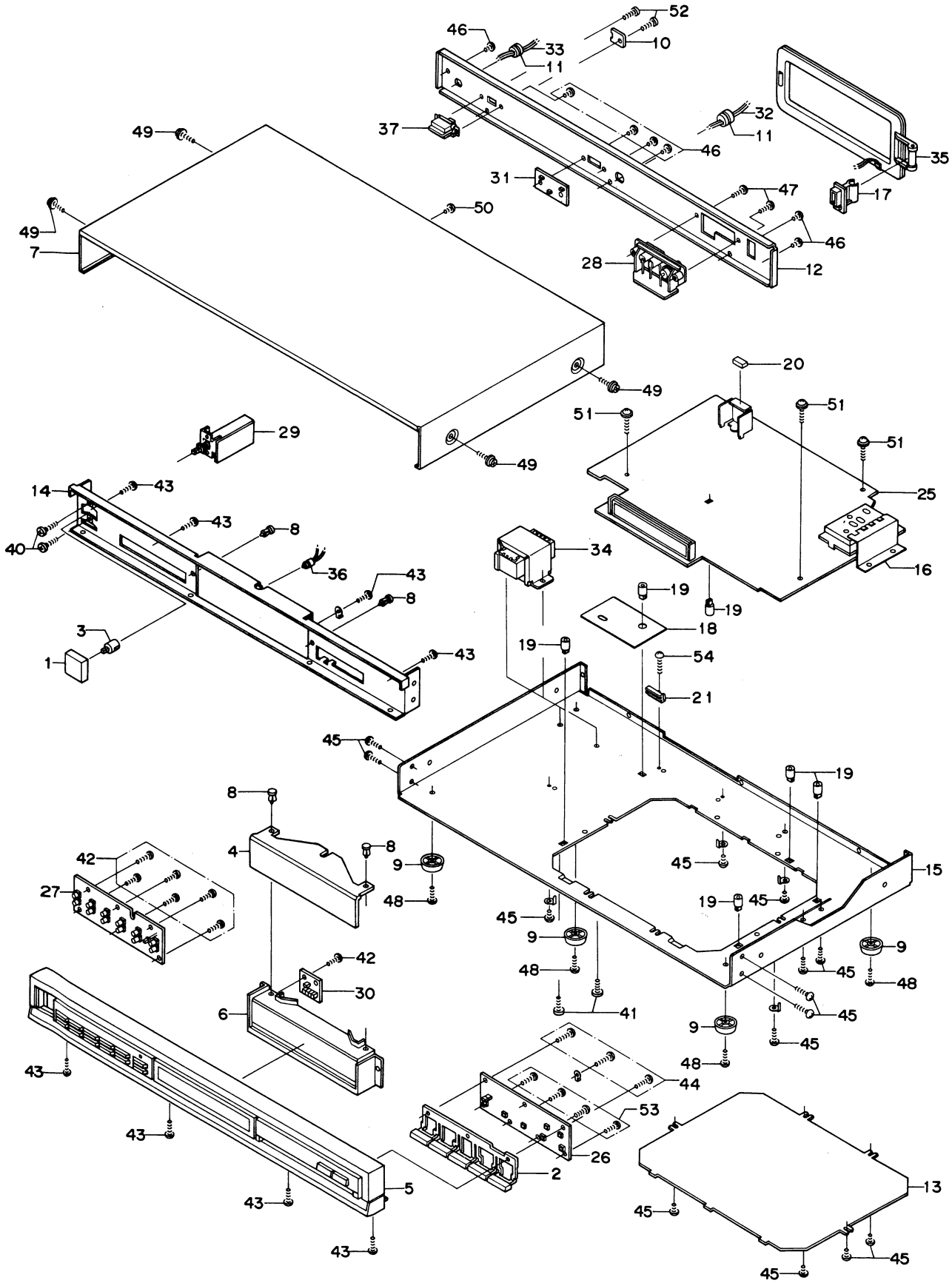


SPECIFICATIONS

LW/MW/FM STEREO TUNER		FM-890	
FM SECTION			
Usable Sensitivity	Mono	1μV	
	Stereo	8μV	
46 dB Quieting Sensitivity	Mono	3μV	
	Stereo	30μV	
Signal-to-Noise Ratio	Mono	70 dB	
	Stereo	67 dB	
Capture Ratio		1.0 dB	
Alt. Channel Selectivity (±300 kHz)		60 dB	
Image Response Ratio		75 dB	
Spurious Response Ratio		80 dB	
IF Response Ratio		110 dB	
AM Suppression Ratio		60 dB	
Total Harmonic Distortion at 46 dB Quieting	Mono	0.3 %	
	Stereo	0.4 %	
Total Harmonic Distortion at 65 dBf (IF Bandwidth Normal)	Mono (100 Hz/1 kHz/6 kHz)	0.05/0.05/0.1 %	
	Stereo (100 Hz/1 kHz/6 kHz)	0.1/0.1/0.1 %	
Stereo Separation	(100 Hz/1 kHz/10 kHz)	45/45/35 dB	
Sub-Carrier Rejection (19 kHz/38 kHz)		65/75 dB	
Audio Frequency Response	(20 Hz – 15 kHz)	±1.0 dB	
AM SECTION		**MW**	**LW**
Usable Sensitivity		600 μV/m	1 mV/m
Selectivity (±10 kHz)		45 dB	45 dB
Signal-to-Noise Ratio		55 dB	55 dB
Image Response Ratio		40 dB	40 dB
IF Response Ratio		60 dB	60 dB
GENERAL			
Power Requirements (50 Hz)		110 / 220 V AC	
Power Consumption		12 Watts	
Dimensions (W x H x D)		440 x 57 x 280 mm	
Weight (approx.)		2.8 kg	

Because its products are subject to continuous improvement, Fisher Corporation reserves the right to modify product designs and specifications without notice and without incurring any obligation.

CABINET & CHASSIS EXPLODED VIEW



CABINET & CHASSIS PARTS LIST

Ref. No.	Part No.	Description	Q'ty
	PACKING PARTS LIST		
	3-9415-10300	Bag Polyethylene	1
	131-6-1169-16823	Box Corrugate-Exp.	1
	131-6-3009-35610	Pad (Right)	1
	131-6-3009-35620	Pad (Left)	1
	131-6-3069-16350	Patching Sheet	1
	131-6-4559-11200	Serial No. Sheet	2
	131-6-9459-00300	Rubber Band	1
	141-6-2519-11022	Poly Cover 110 x 220	1
	141-6-2519-22290	Sheet Polyethylene	1
	ACCESSORIES PARTS LIST		
	131-0-4012-00180	FM Antanna Assy	1
	131-6-2719-10401	Bag Fan	1
	141-2-1729-00500	Holder Antenna	1
	142-6-4119-32890	Explanatory Booklet	1
	CABINET & CHASSIS PARTS LIST		
	4-2379-21520	Terminal Lug	4
	131-6-4559-11200	Serial No. Sheet	1
1	131-2-1601-85203	Knob (Power)	1
2	141-0-1619-36600	Knob Assy (Function)	1
	141-2-1659-75200	Knob Cap	5
	141-2-2629-10100	Holder Knob	1
3	131-2-4219-17100	Shaft	1
4	131-2-6308-23502	Filter (Clear)	1
5	141-0-1129-17901	Cabinet Front Assy	1
	131-2-1601-94800	Knob (Touch Switch)	2
	131-2-4208-49700	Spacer	1
	141-0-1619-36100	Knob Assy (Tact)	1
	141-2-1129-39701	Cabinet Front	1
	141-2-1319-45800	Window	1
	141-2-1449-61246	Plate Front	1
	141-2-1449-70701	Plate Decorate	1
6	141-0-1149-14700	Mount Screen Assy	1
	141-2-1149-48900	Mount Screen	1
	141-2-1439-16600	Screen LED	1
	141-2-1439-16800	Filter Digitron	1
7	141-2-1119-93300	Cover	1
8	131-2-4221-00600	Rivet	4
9	131-2-1801-14100	Leg	4
10	131-2-7104-00500	Plate Pad Switch	1
11	131-2-6111-14200	Bushing (4N-4)	2
12	141-2-1219-36402	Panel Rear	1
13	141-2-1259-09500	Bottom Cover	1
14	141-2-2149-27200	Panel Front	1
15	141-2-3119-27100	Chassis	1
16	141-2-3229-43100	Plate Shield	1
17	141-2-3849-05400	Holder Antenna	1
18	141-2-4359-40700	Plate Sever	1
19	131-2-3614-22900	Mount P.C.B.	6
20	131-2-5205-27401	Cushion	1
21	131-2-3614-18700	Mount P.C.B.	1

Ref. No.	Part No.	Description	Q'ty
	ELECTRICAL PARTS LIST		
25	141-0-1939-17690	Tuner P.C.B. Assy	1
26	141-0-1939-17700	Band Switch P.C.B. Assy	1
27	141-0-1939-17710	Preset Switch P.C.B. Assy	1
28	141-0-1939-17720	Antenna P.C.B. Assy	1
29	141-0-1939-17730	Power Switch P.C.B. Assy	1
30	141-0-1939-17740	Meter LED P.C.B. Assy	1
31	141-0-1939-17750	Remote Control Input P.C.B. Assy	1
32	4-2369-74581	Plug Cord RCA (Output))	1
33	⚠ 4-2432-00502	Power Cord	1
34	⚠ 4-2512-32220	Power Trans	1
35	4-2579-72420	Loop Antenna	1
36	4-6129-70713	Lamp	1
37	⚠ 4-2312-02650	Switch Slide 3P (AC Selector) [SW1]	1
	SCREW PARTS LIST		
40	101-3-1303-00611	Screw, Pan Hd., +M3.0x6	2
41	143-3-1704-01011	Screw, Bind Hd. Tapping-B, +M4.0x10	2
42	143-3-1902-60811	Screw, Brazier Hd. Tapping-B, +M2.6x8	7
43	143-3-1902-60818	Screw, Brazier Hd. Tapping-B, +M2.6x8	8
44	143-3-1902-61011	Screw, Brazier Hd. Tapping-B, +M2.6x10	3
45	143-3-1903-00611	Screw, Brazier Hd. Tapping-B, +M3.0x6	14
46	143-3-1903-00618	Screw, Brazier Hd. Tapping-B, +M3.0x6	7
47	143-3-1903-00818	Screw, Brazier Hd. Tapping-B, +M3.0x8	2
48	143-3-1903-01011	Screw, Brazier Hd. Tapping-B, +M3.0x10	4
49	141-2-4219-38400	Screw, Bind Hd. Tapping-B, +M4.0x8 Sems	4
50	141-2-4219-33101	Screw, Bind Hd. Tapping-B, +M3.0x8 Sems	1
51	131-2-4201-25302	Screw, Sems +3.0x14	3
52	101-3-1303-00818	Screw, Pan Hd., +M3.0x8	2
53	143-3-1302-60811	Screw, Pan Hd. Tapping-B, +M2.6x8	4
54	131-2-4201-16700	Screw, Brazier Hd. Tapping-C, +M3.0x6	1

C1	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C2	CC1-0-2500-KE00C	Ceramic	0.001μF	50V ±10%	1
C3	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1

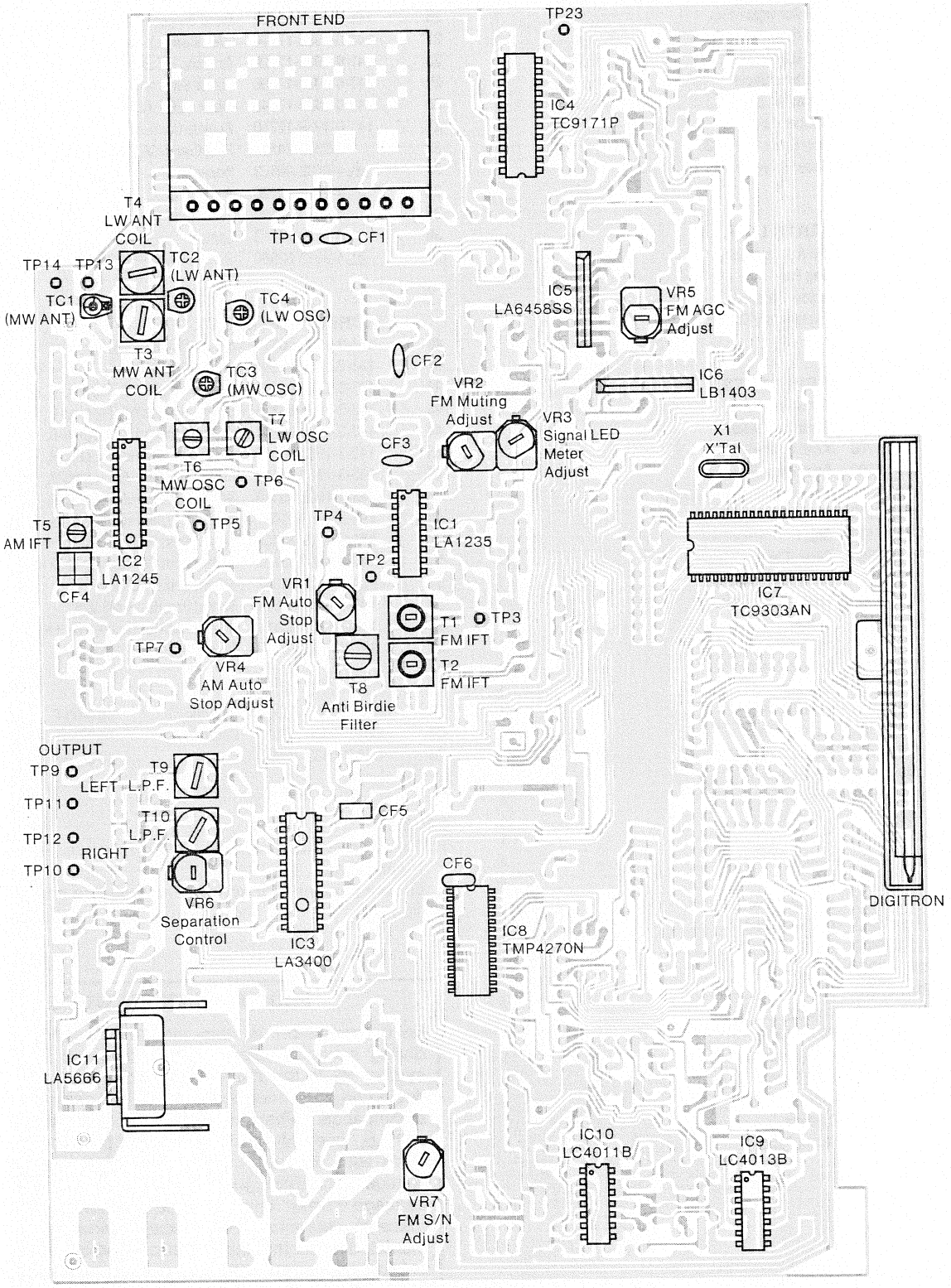
NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

TUNER P.C.BOARD LAYOUT
ALIGNMENT POINTS
(TOP VIEW)



AM TUNER ALIGNMENT

AM ALIGNMENT – FUNCTION switch to LW or MW position.
Maintain generator output as low as possible for suitable indication.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. MW RF FREQUENCY COVER ALIGNMENT (522kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 522kHz.	Connect DC Voltmeter to Front End B2 terminal and ground lead to chassis.	Adjust MW OSC Coil (T6) until DC Voltmeter reads 0.9V ± 0.02V.
2. (1611kHz)	Same as above.	DIGITAL Counter Display Set to 1611kHz.	Same as above.	Adjust Trimmer Condenser TC3 (OSC) until DC Voltmeter reads 8.0V ± 0.1V.
Note: Repeat the adjustments in Items 1 and 2. Then, confirm that each voltage becomes 0.9V to 8.0V at receving frequency of 522kHz to 1611kHz.				
3. LW RF FREQUENCY COVER ALIGNMENT (153kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 153kHz.	Connect DC Voltmeter to Front End B2 terminal and ground lead to chassis.	Adjust LW OSC Coil (T7) until DC Voltmeter reads 1.2V ± 0.05V.
4. (360kHz)	Same as above.	DIGITAL Counter Display Set to 360kHz.	Same as above.	Adjust Trimmer Condenser TC4 (OSC) until DC Voltmeter reads 8.0V ± 0.1V.
Note: Repeat the adjustments in Items 3 and 4. Then, confirm that each voltage becomes 1.2V to 8.0V at receving frequency of 153kHz to 360kHz.				
5. AM IF ALIGNMENT	Connect 450kHz Radio IF Genescope output to testpoint TP13 and TP14 (ground).	Position of non-interference DIGITAL Counter Display Set to 999kHz.	Connect Radio IF Genescope input to TP5 and ground lead to chassis.	Adjust AM IFT (T5) for maximum gain and best symmetry. Keep signal low enough for noise on responce.
6. MW RF TRACKING ALIGNMENT (603kHz)	Connect Standard Loop Antenna to output terminal of AM RF Signal Generator. Place Test Loop Antenna 60cm away from Loop Antenna. Generator Setting to 603kHz or 1404kHz. Modulate with 1kHz (30 % modulation).	DIGITAL Counter Display Set to 603kHz.	Connect AC VTVM and Oscilloscope to TP9 or TP10 TUNER OUT.	Adjust MW Antenna Coil (T3) for maximum gain output.
7. (1404kHz)		DIGITAL Counter Display Set to 1404kHz.	Same as above.	Adjust Trimmer Condenser TC1 (ANT) for maximum gain output.
Note: Repeat the adjustments in Items 6 and 7. Then, confirm there is no tracking error.				
8. LW RF TRACKING ALIGNMENT (160kHz)	Change generator setting to 160kHz.	DIGITAL Counter Display Set to 160kHz.	Connect AC VTVM and Oscilloscope to TP9 or TP10 TUNER OUT.	Adjust LW Antenna Coil (T4) for maximum gain output.
9. (350kHz)	Change generator setting to 350kHz.	DIGITAL Counter Display Set to 350kHz.	Same as above.	Adjust Trimmer Condenser TC2 (ANT) for maximum gain output.
Note: Repeat the adjustments in Items 8 and 9. Then, confirm there is no tracking error.				
10. AM AUTO STOP SENSITIVITY ADJUSTMENT	Change generator setting to 999kHz and output level to 57dB/m.	Set to 999kHz.	Connect DC Voltmeter to TP7.	Adjust VR4 until DC Voltmeter reads 80mV, so that MANUAL/ AUTO Function works at 999kHz on DIGITAL Counter Display.

Use a screwdriver with plastic grip for all adjustments.

FM TUNER ALIGNMENT

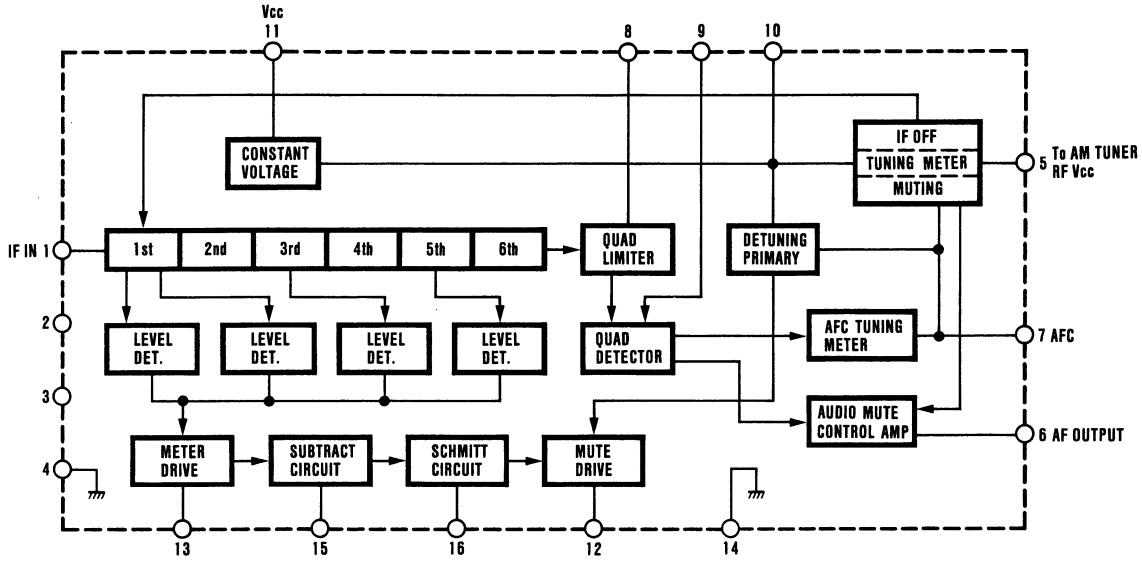
FM ALIGNMENT – FUNCTION switch to FM STEREO

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
Note: The FM IF circuit utilizes a non-turnable ceramic filter which establishes the IF bandpass. To insure symmetrical turning and selectivity, the IF must be aligned precisely to the center of the filter bandpass, rather than to 10.7MHz as in conventional LC circuits.				
1. FM IF S-CURVE ALIGNMENT	Connect 10.7MHz Radio IF Genescope output to testpoint TP1 and ground lead to chassis. Use 5pF capacitor in series with generator output lead.	Position of non-interference.	Connect Radio IF Genescope input to TP4 and ground lead to chassis. Use 1pF capacitor in series with generator output lead.	Adjust FM IF Trans (T1), so that S-curve form becomes symmetrical.
2. DETECTOR ADJUSTMENT (MINIMUM T.H.D.)	Connect FM RF signal generator througt FM Dummy Antenna to FM Antenna terminals. Set generator output level to 60dB at 98MHz ± 2kHz.	Front Panel DIGITAL Counter Display Set to 98MHz.	Harmonic Distortion Meter and Oscilloscope to TUNER OUT.	Adjust FM IF Trans (T2) for minimum gain and best linearity.
Note: Repeat Items 2 until optimum alignment is reached.				
3. FM AUTO STOP SENSIVITY ADJUSTMENT	Same as above.	Same as above.	Connect DC Voltmeter to TP2 and TP3.	Adjust VR1 until DC Voltmeter reads 0V ± 20mV. Press the UP/DOWN button and Check that Auto Stop Function works at 98MHz on DIGITAL Counter Display.
4. FM MUTING LEVEL ADJUSTMENT	Set generator output level to 18dB at 98MHz ± 2kHz.	Same as above.	Scope vertical input to TUNER OUT.	Set Mode Switch (MONO/ST) to STEREO and adjust VR2 until the received curve form becomes half of the maximum form.
Note: Decrease the output level of ATT and confirm that the curve form disappears.Increase the output level of ATT again and confirm that the input level meets the specifications sufficiently when the curve form has appeared.				
5. SIGNAL LED METER ADJUSTMENT	Set generator output level to 60dB at 98MHz ± 2kHz.	DIGITAL Counter Display Set to 98MHz.	Front Panel SIGNAL STRENGTH LED Display.	Adjust VR3 until the fifth signal LED partly lights up.
6. FM AGC ADJUSTMENT	Set generator output level to 0dB at 98MHz ± 2kHz.	Same as above.	Connect DC Voltmeter to Front End AGC terminal and ground.	Adjust VR5 until the DC Voltmeter reads 2.0V ± 0.1V.
7. FM S/N ADJUSTMENT	Set generator output level to 60dB at 98MHz ± 2kHz.	Same as above.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust VR7 for signal to nise ratio.
8. FM STEREO SIGNAL SEPARATION CONTROL	Connect FM Stereo SG to FM Antenna terminals.19kHz signal ON. Main channel, sub channel signal ON Apply 1000Hz signal from LEFT channel.		Connect AC VTVM and Oscilloscope to RIGHT TUNER OUT.	Adjust VR6 for minimum output.
	Same as above for RIGHT channel.		Connect AC VTVM and Oscilloscope to LEFT TUNER OUT.	

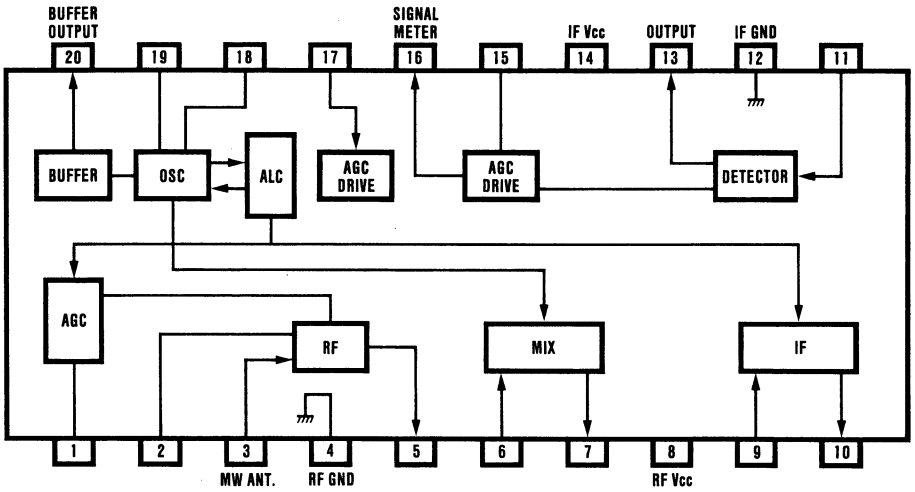
Use a screwdriver with plastic grip for all adjustments.

IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM

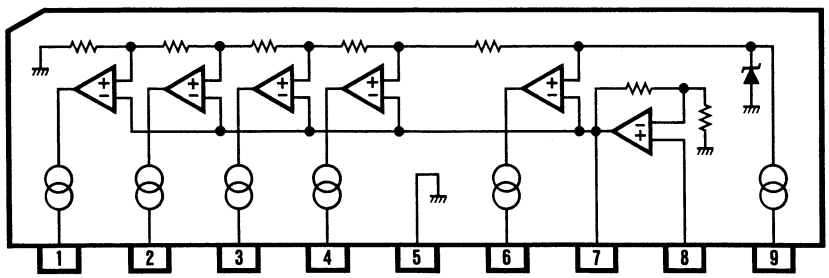
FM IF AMP IC LA 1235



AM IF AMP IC LA 1245

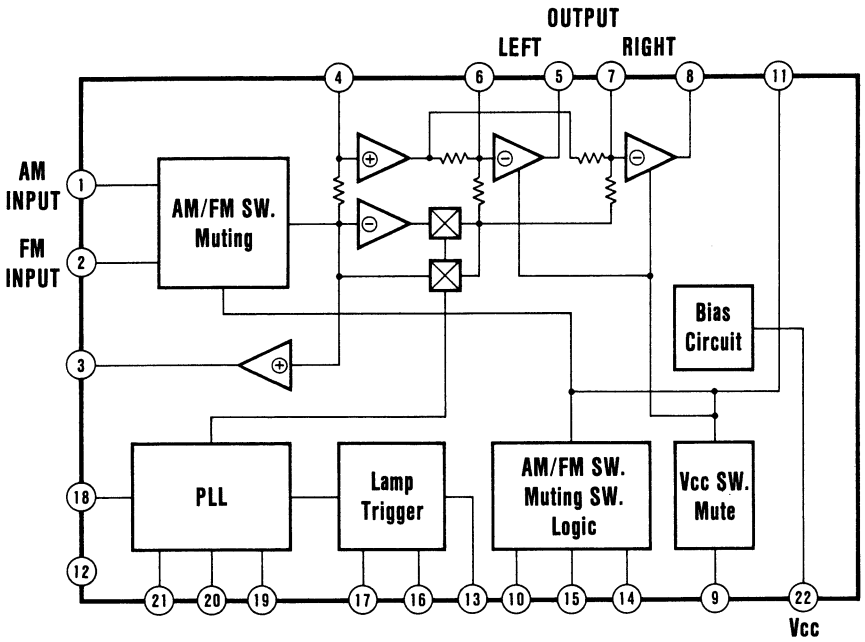


SIGNAL LED METER DRIVE IC LB 1403 N

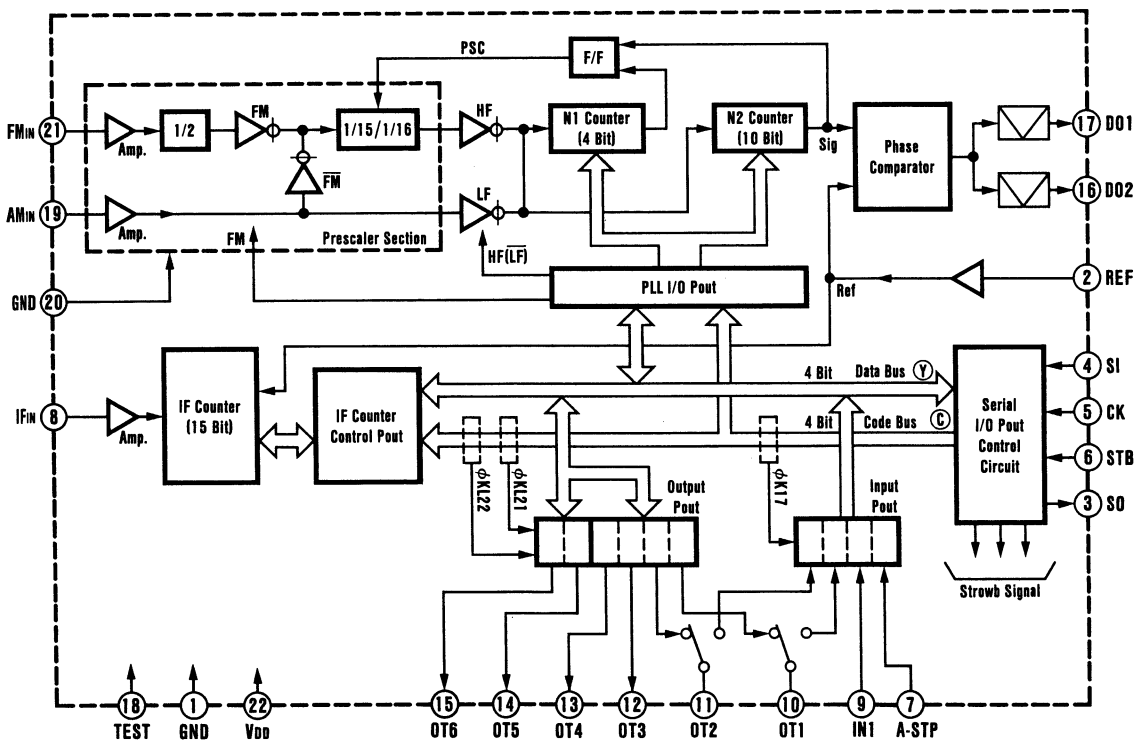


IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

FM MPX IC LA 3400

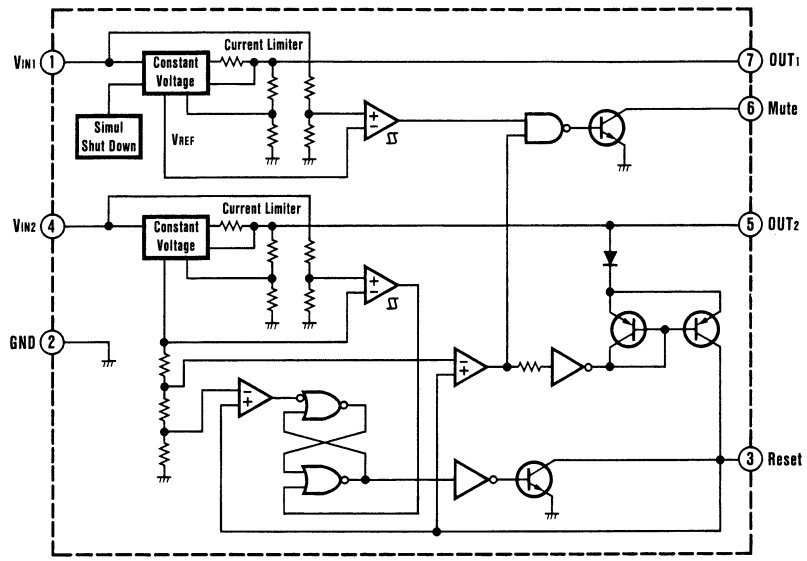


ANALOG FUNCTION SWITCH IC TC 9171P

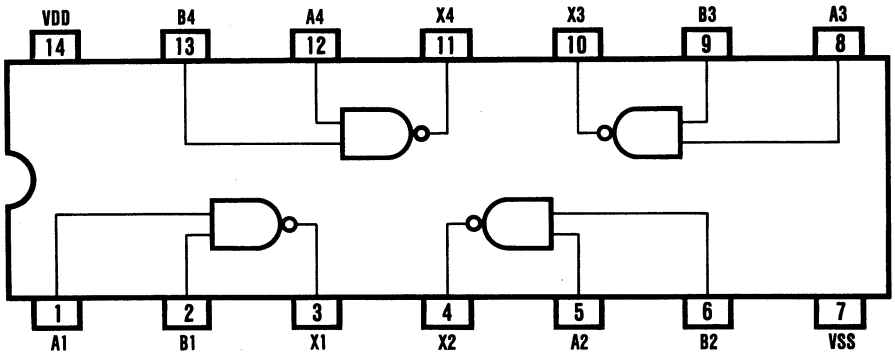


IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

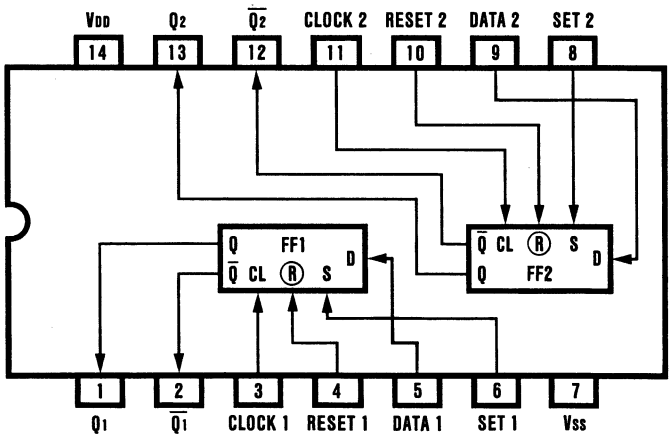
CONSTANT VOLTAGE REGULATOR IC LA 5666



AUTO/MANUAL, ST MUTE IC LC 4013

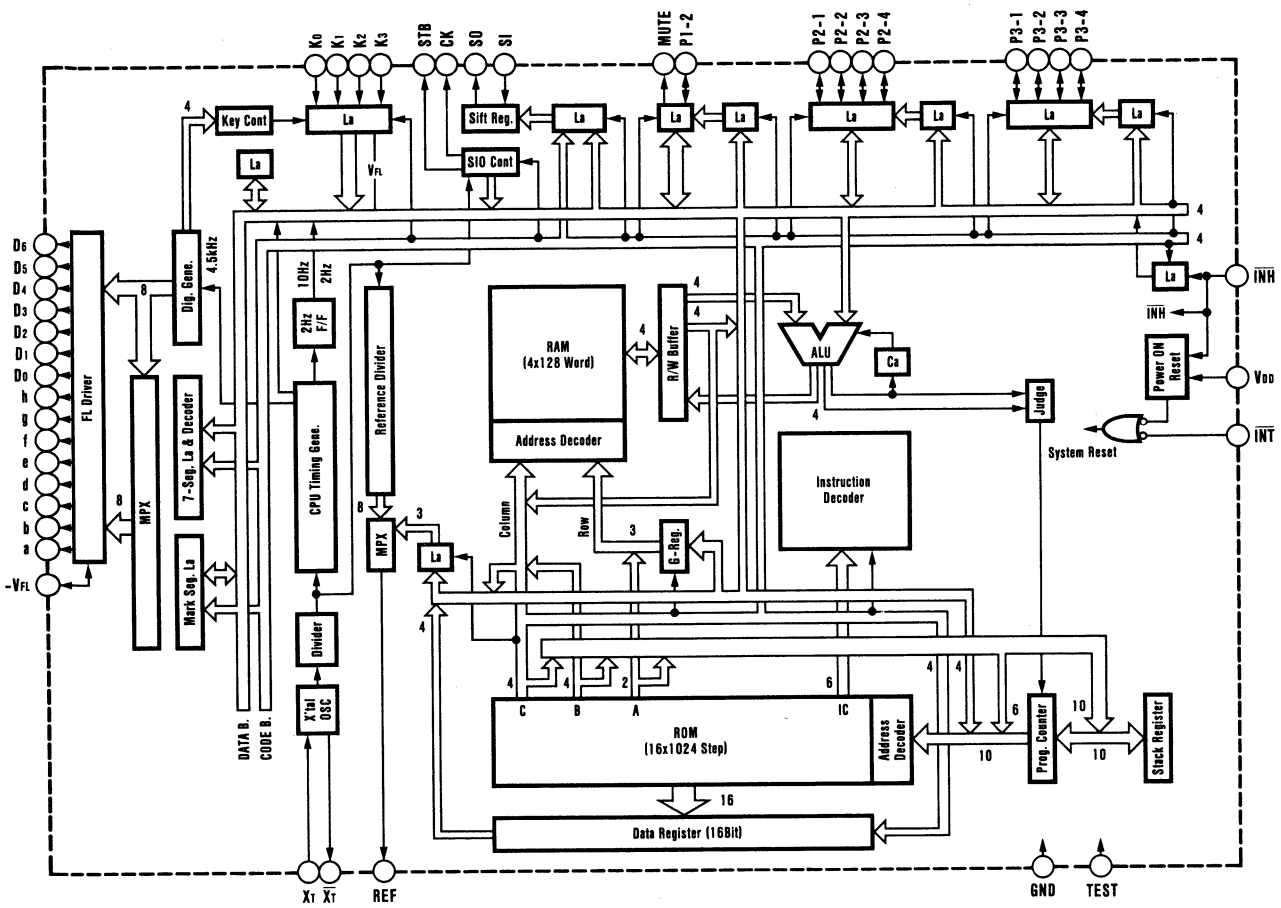


AUTO/MANUAL, ST MUTE IC LC 4011B

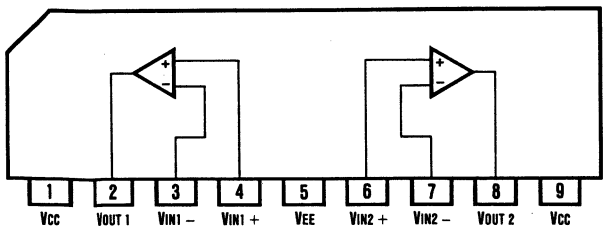


IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

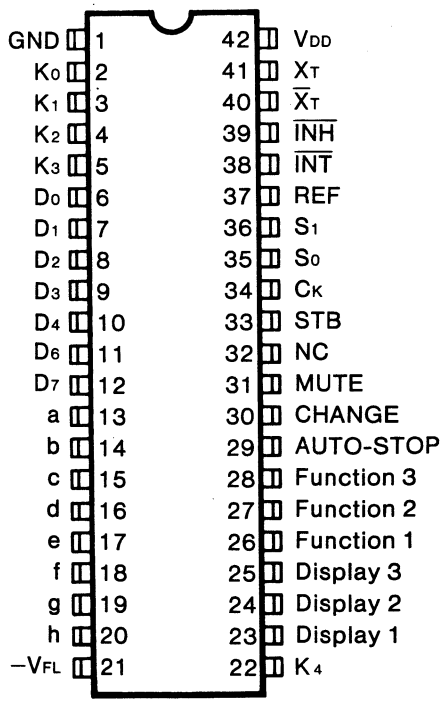
PLL CONTROL IC TC 9303 N



AGC CIRCUIT IC LA 6458 SS

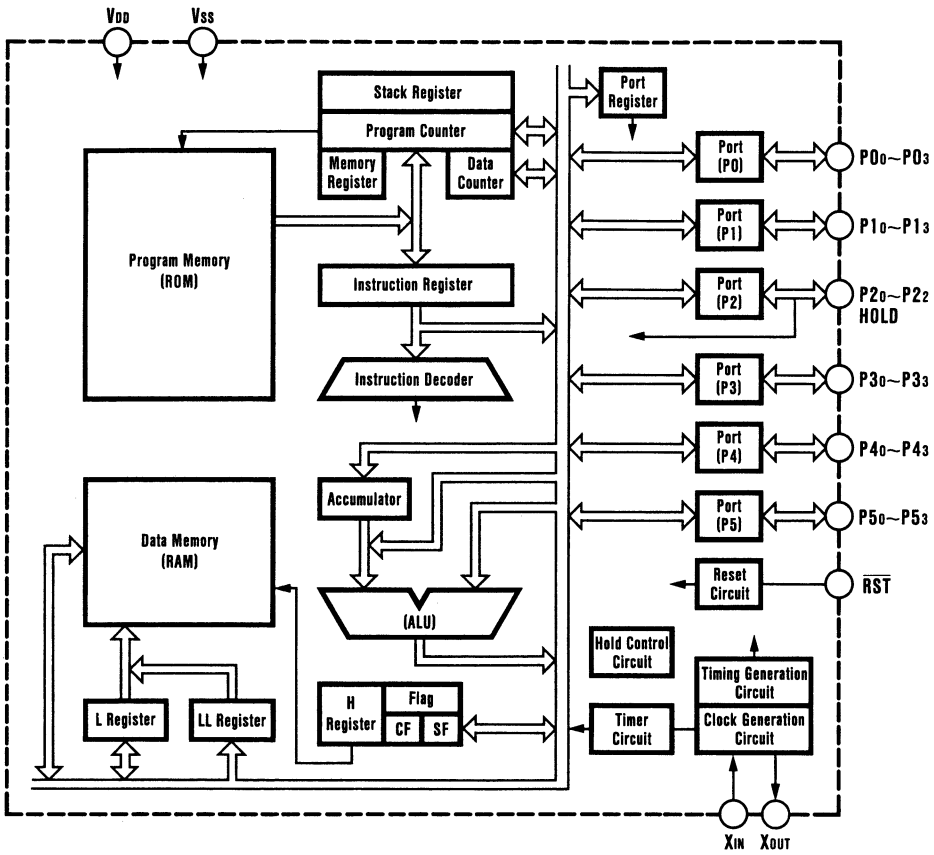


(TOP VIEW)



IC EQUIVALENT CIRCUIT & BLOCK DIAGRAM (Continued)

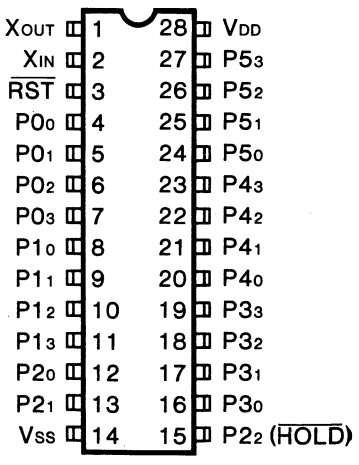
REMOTE CONTROL MICRO PROCESSOR LSI TMP 4270 N



TMP 4270 N PORT ASSIGNMENTS

Pin No.	Port Name	Assignment	Pin No.	Port Name	Assignment
3	$\overline{RST}$		16	$P3_0$	1
4	$P0_0$	DaTa	17	$P3_1$	2
5	$P0_1$	CLocK	18	$P3_2$	3
6	$P0_2$	ReaDY	19	$P3_3$	4
7	$P0_3$	REQuest			
			20	$P4_0$	5
8	$P1_0$	–	21	$P4_1$	6
9	$P1_1$	FM	22	$P4_2$	7
10	$P1_2$	MW	23	$P4_3$	8
11	$P1_3$	–			
			24	$P5_0$	9
12	$P2_0$	MUTE IN	25	$P5_1$	10
13	$P2_1$	D04 (L)	26	$P5_2$	–
15	$P2_2$	D06 (L)	27	$P5_3$	–

(TOP VIEW)



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description			Q'ty
	TUNER P.C.B. ASSY				
25	141-0-1939-17690	Tuner P.C.B. Assy			1
	4-2262-29450	Tuner P.C.B.			1
	4-1252-00345	Front End			1
		(Component parts used in Front End are not serviceable and available.)			
	4-2149-70050	Digitron			1
	⚠ 4-2349-20131	Fuse T400mA			1
VR1	4-2222-01020	Potentiometer (B-200kΩ)			1
VR2	4-2222-01400	Potentiometer (B-10kΩ)			1
VR3	4-2222-00960	Potentiometer (B-100kΩ)			1
VR4	4-2222-00960	Potentiometer (B-100kΩ)			1
VR5	4-2222-01040	Potentiometer (B-20kΩ)			1
VR6	4-2222-00960	Potentiometer (B-100kΩ)			1
VR7	4-2222-01280	Potentiometer (B-100Ω)			1
X1	4-2252-00082	Crystal 7.2MHz			1
CF1	4-2272-00261	Ceramic Filter			1
CF2	4-2272-00261	Ceramic Filter			1
CF3	4-2272-00261	Ceramic Filter			1
CF4	4-2272-00230	Ceramic Filter 450kHz			1
CF5	4-2279-70080	Ceramic OSC			1
CF6	4-2279-70110	Ceramic OSC 2MHz			1
L1	4-2532-00440	Choke Coil (100μH)			1
L2	4-2539-20410	Choke Coil (470μH)			1
L3	4-2539-20410	Choke Coil (470μH)			1
L4	4-2539-20410	Choke Coil (470μH)			1
L5	4-2552-00561	Coil (39mH)			1
T1	4-2569-72070	FM IF Trans			1
T2	4-2569-72080	FM IF Trans			1
T3	4-2579-71730	MW ANT Coil			1
T4	4-2579-71740	LW ANT Coil			1
T5	4-2569-71551	AM IFT			1
T6	4-2589-72471	MW OSC Coil			1
T7	4-2589-72481	LW OSC Coil			1
T8	4-2529-70230	Anti Birdie Filter			1
T9	4-2529-70330	LP Filter			1
T10	4-2529-70330	LP Filter			1
TC1	4-2249-70581	Trimmer Condenser			1
TC2	4-2242-00111	Ceramic Trimmer 20pF			1
TC3	4-2242-00111	Ceramic Trimmer 20pF			1
TC4	4-2242-00111	Ceramic Trimmer 20pF			1
CN1	4-2369-73150	Plug 5P			1
CN2	4-2369-75580	Plug 5P			1
CN3	4-2369-76000	Plug 7P			1
CN4	4-2369-73410	Plug 7P			1
CN5	4-2362-00900	Plug 8P			1
	4-2369-72920	Plug 5P (Data Preset)			1
	4-2352-00200	Fuse Holder			2
	4-2372-00830	EC Terminal 1P			2
	111-2-6220-11100	Wire Wrap Terminal			22
	131-2-5205-22503	Cushion			1
	141-2-3689-13700	Plate Heatsink (for IC11)			1
	141-2-3889-04400	Bracket Digitron			1
	CAPACITORS				
C1	CD3-3-7160-0006V	Electrolytic	330μF	16V	1
C2	CC1-0-2500-KE00C	Ceramic	0.001μF	50V ±10%	1
C3	CD2-2-4500-0001V	Electrolytic	0.22μF	50V	1
C4	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V +80,-20%	1
C5	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V +80,-20%	1
C6	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V +80,-20%	1
C7	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V +80,-20%	1

Ref. No.	Part No.	Description			Q'ty
C8	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C9	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C10	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C11	CC4-7-1500-KD00C	Ceramic	470pF	50V ±10%	1
C12	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C13	CD4-7-4500-0001V	Electrolytic	0.47μF	50V	1
C14	CD4-7-6160-0001V	Electrolytic	47μF	16V	1
C15	CI2-2-3160-NG00R	Boundary	0.022μF	16V ±30%	1
C16	CD2-2-7100-0006V	Electrolytic	220μF	10V	1
C17	CI2-2-3160-NG00R	Boundary	0.022μF	16V ±30%	1
C18	CD1-0-7160-0001V	Electrolytic	100μF	16V	1
C19	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C20	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C21	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C22	CD1-0-4500-0001V	Electrolytic	0.1μF	50V	1
C23	CD1-0-4500-0001V	Electrolytic	0.1μF	50V	1
C24	CD4-7-5250-0001V	Electrolytic	4.7μF	25V	1
C25	CI2-2-3160-NG00R	Boundary	0.022μF	16V ±30%	1
C26	CD1-0-4500-0001V	Electrolytic	0.1μF	50V	1
C27	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V +80,-20%	1
C28	CC1-2-0500-JD00C	Ceramic	12pF	50V ±5%	1
C29	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C30	CC4-7-0500-KD00C	Ceramic	47pF	50V ±10%	1
C31	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C32	CD1-0-6160-0001V	Electrolytic	10μF	16V	1
C33	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C34	CC1-0-2500-KE00C	Ceramic	0.001μF	50V ±10%	1
C35	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C36	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C37	CD1-0-6160-0001V	Electrolytic	10μF	16V	1
C38	CC4-7-0500-KD00C	Ceramic	47pF	50V ±10%	1
C39	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C40	CC2-7-1500-KE00C	Ceramic	270pF	50V ±10%	1
C41	CC1-0-2500-KE00C	Ceramic	0.001μF	50V ±10%	1
C42	CD4-7-6160-0001V	Electrolytic	47μF	16V	1
C43	CM1-0-3500-K00SV	Mylar	0.01μF	50V ±10%	1
C44	CD4-7-4500-0001V	Electrolytic	0.47μF	50V	1
C45	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C46	CD4-7-5250-0001V	Electrolytic	4.7μF	25V	1
C47	CD4-7-5250-0001V	Electrolytic	4.7μF	25V	1
C48	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C49	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C50	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C51	CS4-3-1500-J000V	Polystyroul	430pF	50V ±5%	1
C52	CS3-3-1500-J000V	Polystyroul	330pF	50V ±5%	1
C53	CC3-9-0500-KD00C	Ceramic	39pF	50V ±10%	1
C54	CM2-7-3500-K00SV	Mylar	0.027μF	50V ±10%	1
C55	CM1-0-3500-K00SV	Mylar	0.01μF	50V ±10%	1
C56	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C57	CI2-2-3160-NG00R	Boundary	0.022μF	16V ±30%	1
C58	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C59	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C60	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C61	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C62	CC2-2-3500-ZG00C	Ceramic	0.022μF	50V +80,-20%	1
C63	CD1-0-7160-0001V	Electrolytic	100μF	16V	1
C64	CD2-2-4500-0001V	Electrolytic	0.22μF	50V	1
C65	CD1-0-5500-0001V	Electrolytic	1μF	50V	1
C66	CD4-7-5250-0001V	Electrolytic	4.7μF	25V	1
C67	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V +80,-20%	1
C68	CM4-7-3500-K00SV	Mylar	0.047μF	50V ±10%	1
C69	CM2-2-2500-K00SV	Mylar	0.0022μF	50V ±10%	1
C70	CD1-0-6160-0001V	Electrolytic	10μF	16V	1
C71	CC3-3-1500-KD00C	Ceramic	330pF	50V ±10%	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.		Description			Q'ty
C72	CC3-3-1500-KD00C	Ceramic	330pF	50V	±10%	1
C73	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C74	CD4-7-5250-0001V	Electrolytic	4.7μF	25V		1
C75	CM2-7-2500-K00SV	Mylar	0.0027μF	50V	±10%	1
C76	CM2-7-2500-K00SV	Mylar	0.0027μF	50V	±10%	1
C77	CD1-0-7160-0001V	Electrolytic	100μF	16V		1
C78	CD2-2-5500-0001V	Electrolytic	2.2μF	50V		1
C79	CD1-0-7250-0006V	Electrolytic	100μF	25V		1
C80	CD1-0-7100-0T11V	Electrolytic	100μF	10V		1
C81	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
C82	CD2-2-5500-0001V	Electrolytic	2.2μF	50V		1
C83	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
C84	CI2-2-3160-NG00R	Boundary	0.022μF	16V	±30%	1
C85	CM1-0-3500-K00SV	Mylar	0.01μF	50V	±10%	1
C86	CD4-7-4500-0001V	Electrolytic	0.47μF	50V		1
C87	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
C88	CD1-0-7160-0001V	Electrolytic	100μF	16V		1
C89	CD1-0-6160-0001V	Electrolytic	10μF	16V		1
C90	CD1-0-6160-0001V	Electrolytic	10μF	16V		1
C91	CC1-0-1500-KD00C	Ceramic	100pF	50V	±10%	1
C92	CD1-0-6160-0001V	Electrolytic	10μF	16V		1
C93	CD4-7-6160-0001V	Electrolytic	47μF	16V		1
C94	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C95	CD3-3-7160-0006V	Electrolytic	330μF	16V		1
C96	CD2-2-8100-0001V	Electrolytic	2200μF	10V		1
C97	CC3-3-0500-JCH0C	Ceramic	33pF	50V	±5%	1
C98	CC2-7-0500-JCH0C	Ceramic	27pF	50V	±5%	1
C99	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C100	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C101	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C102	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C103	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C104	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C105	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C106	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C107	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C108	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C109	CC4-7-1500-KE00R	Ceramic	470pF	50V	±10%	1
C110	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C111	CD4-7-6100-0001V	Electrolytic	47μF	10V		1
C112	CC6-8-0500-KD00C	Ceramic	68pF	50V	±10%	1
C113	CC6-8-0500-KD00C	Ceramic	68pF	50V	±10%	1
C114	CD1-0-7100-0001V	Electrolytic	100μF	10V		1
C115	CD3-3-5500-0001V	Electrolytic	3.3μF	50V		1
C116	CD3-3-5500-0001V	Electrolytic	3.3μF	50V		1
C117	CD1-0-4500-0001V	Electrolytic	0.1μF	50V		1
C118	CD1-0-6160-0001V	Electrolytic	10μF	16V		1
C119	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C120	CD3-3-7350-0006V	Electrolytic	330μF	35V		1
C121	CD3-3-7630-0006V	Electrolytic	330μF	63V		1
C122	CD2-2-7350-0001V	Electrolytic	220μF	35V		1
C123	CD1-0-7350-0006V	Electrolytic	100μF	35V		1
C124	CD3-3-6350-0006V	Electrolytic	33μF	35V		1
C125	CD1-0-7250-0006V	Electrolytic	100μF	25V		1
C126	CD1-0-7100-0001V	Electrolytic	100μF	10V		1
C127	CD1-0-8350-0001V	Electrolytic	1000μF	35V		1
C128	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C129	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C130	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C131	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C132	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C133	CM2-2-2500-K00SV	Mylar	0.0022μF	50V	±10%	1
C141	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C142	CC4-7-3500-ZG00C	Ceramic	0.047μF	50V	+80,-20%	1
C143	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1
C144	CC1-0-3500-ZG00C	Ceramic	0.01μF	50V	+80,-20%	1

SEMICONDUCTORS

If necessary, replace both Diode D2, D3 (SVC 321) together with new ones which have the equivalent characteristics.

Ref. No.	Part No.	Description	Q'ty
D1	202-5-2810-44210	Diode, DS 442	1
D2	202-5-1220-32113	Diode, SVC 321	1
D3	202-5-1220-32113	Diode, SVC 321	1
D4	202-5-2810-44210	Diode, DS 442	1
D5	202-5-2810-44210	Diode, DS 442	1
D6	202-5-1410-00110	Diode, GMA 01	1
D7	202-5-2810-44210	Diode, DS 442	1
D8	202-5-1410-00110	Diode, GMA 01	1
D9	202-5-1410-00110	Diode, GMA 01	1
D10	202-5-2810-44210	Diode, DS 442	1
D11	202-5-1410-00110	Diode, GMA 01	1
D12	202-5-1410-00110	Diode, GMA 01	1
D13	202-5-2810-44210	Diode, DS 442	1
D14	202-5-1410-00110	Diode, GMA 01	1
D15	202-5-2810-44210	Diode, DS 442	1
D16	202-5-1410-00110	Diode, GMA 01	1
D17	202-5-2810-44210	Diode, DS 442	1
D18	202-5-2810-44210	Diode, DS 442	1
D19	202-5-2810-44210	Diode, DS 442	1
D20	202-5-2810-44210	Diode, DS 442	1
D21	202-5-2810-44210	Diode, DS 442	1
D22	202-5-2810-44210	Diode, DS 442	1
D23	202-5-2810-44210	Diode, DS 442	1
D24	202-5-2810-44210	Diode, DS 442	1
D25	202-5-2810-44210	Diode, DS 442	1
D26	202-5-2810-44210	Diode, DS 442	1
D27	202-5-2810-44210	Diode, DS 442	1
D28	202-5-2810-44210	Diode, DS 442	1
D29	202-5-2810-44210	Diode, DS 442	1
D30	202-5-2810-44210	Diode, DS 442	1
D31	202-5-2810-44210	Diode, DS 442	1
D32	202-5-1410-00110	Diode, GMA 01	1
D35	202-5-1410-00110	Diode, GMA 01	1
D36	202-5-1410-00110	Diode, GMA 01	1
D37	202-5-1410-00110	Diode, GMA 01	1
D38	202-5-1410-00110	Diode, GMA 01	1
D39	202-5-2810-44210	Diode, DS 442	1
D40	202-5-2810-44210	Diode, DS 442	1
D41	202-5-2810-44210	Diode, DS 442	1
D42	202-5-2810-44210	Diode, DS 442	1
D43	202-5-2810-44210	Diode, DS 442	1
D44	202-5-1410-00110	Diode, GMA 01	1
D45	202-5-1410-00110	Diode, GMA 01	1
D46	202-5-1410-00110	Diode, GMA 01	1
D47	202-5-2810-44210	Diode, DS 442	1
D48	202-5-2810-44210	Diode, DS 442	1
D49	202-5-2810-44210	Diode, DS 442	1
D50	202-5-2810-44210	Diode, DS 442	1
D51	202-5-2810-44210	Diode, DS 442	1
D52	202-5-2810-44210	Diode, DS 442	1
D53	202-5-2810-44210	Diode, DS 442	1
D54	202-5-2810-44210	Diode, DS 442	1
D55	202-5-2810-44210	Diode, DS 442	1
D56	202-5-1410-00110	Diode, GMA 01	1
D57	202-5-1410-00110	Diode, GMA 01	1
D58	202-5-1410-00110	Diode, GMA 01	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
D59	202-5-1410-00110	Diode, GMA 01	1
D60	202-5-2810-44210	Diode, DS 442	1
D61	202-5-2810-44210	Diode, DS 442	1
D62	202-5-2810-44210	Diode, DS 442	1
D63	202-5-2810-44210	Diode, DS 442	1
D64	202-5-2810-44210	Diode, DS 442	1
D65	202-5-2810-44210	Diode, DS 442	1
D66	202-5-2810-44210	Diode, DS 442	1
D67	202-5-2810-44210	Diode, DS 442	1
D68	202-5-2810-44210	Diode, DS 442	1
D69	202-5-2810-44210	Diode, DS 442	1
D70	202-5-3210-06212	Zener Diode, GZA 6.2Y	1
D71	202-5-3210-24013	Zener Diode, GZA 24Z	1
D72	202-5-0220-01010	Diode, DSF 10 C	1
D73	202-5-0220-01010	Diode, DSF 10 C	1
D74	202-5-0220-01010	Diode, DSF 10 C	1
D75	202-5-0220-01010	Diode, DSF 10 C	1
D76	202-5-0220-01010	Diode, DSF 10 C	1
D77	202-5-0220-01010	Diode, DSF 10 C	1
IC1	206-5-1231-23510	IC, LA 1235-ST	1
IC2	206-5-0191-24510	IC, LA 1245-ST	1
IC3	207-5-0743-40010	IC, LA 3400	1
IC4	4-2069-75630	IC, TC 9171P	1
IC5	206-5-3266-45810	IC, LA 6458 SS	1
IC6	206-5-2591-40310	IC, LB 1403	1
IC7	4-2069-75290	IC, TC 9303AN-001	1
IC8	4-2069-75230	IC, TMP 4270N	1
IC9	206-5-9464-01310	IC, LC 4013 B	1
IC10	206-5-9504-01110	IC, LC 4011 B	1
IC11	216-5-0815-66610	IC, LA 5666	1
Q1	203-5-5500-93050	Transistor, 2SC 930	1
Q2	203-5-5500-93050	Transistor, 2SC 930	1
Q3	203-5-5500-93050	Transistor, 2SC 930	1
Q4	203-5-5500-93050	Transistor, 2SC 930	1
Q5	203-5-5000-53670	Transistor, 2SC 536	1
Q6	203-5-5000-53670	Transistor, 2SC 536	1
Q7	TTT--2SK2-46-G	FET, 2SK 246	1
Q8	203-5-5000-53670	Transistor, 2SC 536	1
Q9	203-5-5000-53670	Transistor, 2SC 536	1
Q10	203-5-5000-53670	Transistor, 2SC 536	1
Q11	203-5-5000-53670	Transistor, 2SC 536	1
Q12	203-5-5000-53670	Transistor, 2SC 536	1
Q13	203-5-5000-53670	Transistor, 2SC 536	1
Q14	203-5-5000-53670	Transistor, 2SC 536	1
Q15	203-5-5000-53670	Transistor, 2SC 536	1
Q16	203-5-5000-53670	Transistor, 2SC 536	1
Q17	203-5-5000-53670	Transistor, 2SC 536	1
Q18	203-5-5000-53670	Transistor, 2SC 536	1
Q19	203-5-4921-01274	Transistor, 2SD 1012	1
Q20	203-5-4921-01274	Transistor, 2SD 1012	1
Q21	203-5-5000-53670	Transistor, 2SC 536	1
Q22	203-5-7230-60870	Transistor, 2SA 608	1
Q23	203-5-5000-53670	Transistor, 2SC 536	1
Q24	203-5-5000-53670	Transistor, 2SC 536	1
Q25	203-5-7230-60870	Transistor, 2SA 608	1
Q26	203-5-5000-53670	Transistor, 2SC 536	1
Q27	203-5-7230-60870	Transistor, 2SA 608	1
Q28	203-5-5000-53670	Transistor, 2SC 536	1
Q29	203-5-7230-60870	Transistor, 2SA 608	1
Q30	203-5-7230-60870	Transistor, 2SA 608	1
Q31	203-5-7230-60870	Transistor, 2SA 608	1
Q32	203-5-7230-60870	Transistor, 2SA 608	1
Q33	203-5-7230-60870	Transistor, 2SA 608	1
Q34	203-5-7230-60870	Transistor, 2SA 608	1
Q35	203-5-7230-60870	Transistor, 2SA 608	1
Q36	203-5-7230-60870	Transistor, 2SA 608	1
Q37	203-5-7230-60870	Transistor, 2SA 608	1
Q38	203-5-7230-60870	Transistor, 2SA 608	1
Q39	203-5-7230-60870	Transistor, 2SA 608	1
Q40	203-5-7230-60870	Transistor, 2SA 608	1
Q41	203-5-7230-60870	Transistor, 2SA 608	1
Q42	203-5-7230-60870	Transistor, 2SA 608	1
Q43	203-5-7230-60870	Transistor, 2SA 608	1
Q44	203-5-7230-60870	Transistor, 2SA 608	1
Q45	203-5-7230-60870	Transistor, 2SA 608	1
Q46	203-5-7230-60870	Transistor, 2SA 608	1
Q47	203-5-7230-60870	Transistor, 2SA 608	1
Q48	203-5-7230-60870	Transistor, 2SA 608	1
Q49	203-5-5000-53670	Transistor, 2SC 536	1
Q50	203-5-7230-60870	Transistor, 2SA 608	1
Q51	203-5-7230-60870	Transistor, 2SA 608	1
Q52	203-5-7230-60870	Transistor, 2SA 608	1
Q53	203-5-7230-60870	Transistor, 2SA 608	1
Q54	203-5-7230-60870	Transistor, 2SA 608	1
	RESISTORS		
R1	401 018 2800	CARBON 330 JA 1/4W	1
R2	401 018 2800	CARBON 330 JA 1/4W	1
R3	401 027 2303	CARBON 560 JA 1/6W	1
R4	401 017 2801	CARBON 27K JA 1/4W	1
R5	401 025 4606	CARBON 18K JA 1/6W	1
R6	401 018 2800	CARBON 330 JA 1/4W	1
R7	401 018 2800	CARBON 330 JA 1/4W	1
R8	401 027 2303	CARBON 560 JA 1/6W	1
R9	401 017 2801	CARBON 27K JA 1/4W	1
R10	401 025 4606	CARBON 18K JA 1/6W	1
R11	401 018 2404	CARBON 330 JA 1/4W	1
R12	401 014 2408	CARBON 150 JA 1/4W	1
R13	401 018 2800	CARBON 330 JA 1/4W	1
R14	401 020 3901	CARBON 470K JA 1/4W	1
R15	401 014 5201	CARBON 15K JA 1/4W	1
R16	401 027 2600	CARBON 5.6K JA 1/6W	1
R17	401 026 7408	CARBON 39K JA 1/6W	1
R18	401 027 0309	CARBON 47K JA 1/6W	1
R19	401 025 8703	CARBON 220K JA 1/6W	1
R20	401 015 1301	CARBON 180 JA 1/4W	1
R21	401 027 2600	CARBON 5.6K JA 1/6W	1
R22	401 024 7004	CARBON 1K JA 1/6W	1
R23	401 027 0309	CARBON 47K JA 1/6W	1
R24	401 027 5908	CARBON 68K JA 1/6W	1
R25	401 012 7009	CARBON 10K JA 1/4W	1
R26	401 024 6700	CARBON 100 JA 1/6W	1
R27	401 026 4308	CARBON 3.3K JA 1/6W	1
R28	401 016 4806	CARBON 22K JA 1/4W	1
R29	401 019 1901	CARBON 3.9K JA 1/4W	1
R30	401 024 8001	CARBON 1M JA 1/6W	1
R31	401 027 2303	CARBON 560 JA 1/6W	1
R32	401 026 1000	CARBON 2.7K JA 1/6W	1
R33	401 016 2208	CARBON 220 JA 1/4W	1
R34	401 024 6700	CARBON 100 JA 1/6W	1
R35	401 025 1605	CARBON 1.5K JA 1/6W	1
R36	401 025 7805	CARBON 2.2K JA 1/6W	1
R37	401 025 1605	CARBON 1.5K JA 1/6W	1
R38	401 027 8107	CARBON 82 JA 1/6W	1
R39	401 012 7009	CARBON 10K JA 1/4W	1
R40	401 024 7400	CARBON 10K JA 1/6W	1
R41	401 019 1901	CARBON 3.9K JA 1/4W	1
R42	401 016 4806	CARBON 22K JA 1/4W	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
R43	401 012 9300	CARBON 1M JA 1/4W	1
R44	401 012 8105	CARBON 100K JA 1/4W	1
R45	401 012 8105	CARBON 100K JA 1/4W	1
R46	401 012 8105	CARBON 100K JA 1/4W	1
R47	401 012 8105	CARBON 100K JA 1/4W	1
R48	401 012 7009	CARBON 10K JA 1/4W	1
R49	401 024 7400	CARBON 10K JA 1/6W	1
R50	401 024 7400	CARBON 10K JA 1/6W	1
R51	401 015 1301	CARBON 180 JA 1/4W	1
R52	401 024 7707	CARBON 100K JA 1/6W	1
R53	401 024 7707	CARBON 100K JA 1/6W	1
R54	401 025 7805	CARBON 2.2K JA 1/6W	1
R55	401 026 4308	CARBON 3.3K JA 1/6W	1
R56	401 025 2305	CARBON 150K JA 1/6W	1
R57	401 027 3003	CARBON 56K JA 1/6W	1
R58	401 026 4308	CARBON 3.3K JA 1/6W	1
R59	401 024 9305	CARBON 1.2K JA 1/6W	1
R60	401 012 7009	CARBON 10K JA 1/4W	1
R61	401 024 7400	CARBON 10K JA 1/6W	1
R62	401 012 7009	CARBON 10K JA 1/4W	1
R63	401 018 2404	CARBON 330 JA 1/4W	1
R64	401 025 4606	CARBON 18K JA 1/6W	1
R65	401 019 4001	CARBON 390K JA 1/4W	1
R66	401 025 4606	CARBON 18K JA 1/6W	1
R67	401 014 2408	CARBON 150 JA 1/4W	1
R68	401 017 2801	CARBON 27K JA 1/4W	1
R69	401 026 1307	CARBON 27K JA 1/6W	1
R70	401 025 8208	CARBON 22K JA 1/6W	1
R71	401 026 4308	CARBON 3.3K JA 1/6W	1
R72	401 014 5201	CARBON 15K JA 1/4W	1
R73	401 017 2801	CARBON 27K JA 1/4W	1
R74	401 015 2704	CARBON 1.8K JA 1/4W	1
R75	401 025 2305	CARBON 150K JA 1/6W	1
R76	401 025 2305	CARBON 150K JA 1/6W	1
R77	401 025 0004	CARBON 120K JA 1/6W	1
R78	401 025 0004	CARBON 120K JA 1/6W	1
R79	401 025 7805	CARBON 2.2K JA 1/6W	1
R80	401 016 3809	CARBON 2.2K JA 1/4W	1
R81	401 026 9907	CARBON 4.7K JA 1/6W	1
R82	401 026 9907	CARBON 4.7K JA 1/6W	1
R83	401 024 7004	CARBON 1K JA 1/6W	1
R84	401 024 7004	CARBON 1K JA 1/6W	1
R85	401 021 3009	CARBON 5.6K JA 1/4W	1
R86	401 027 2600	CARBON 5.6K JA 1/6W	1
R87	401 024 7707	CARBON 100K JA 1/6W	1
R88	401 025 8208	CARBON 22K JA 1/6W	1
R89	401 025 8208	CARBON 22K JA 1/6W	1
R90	401 025 8703	CARBON 220K JA 1/6W	1
R91	401 021 3009	CARBON 5.6K JA 1/4W	1
R92	401 021 3009	CARBON 5.6K JA 1/4W	1
R93	401 017 1804	CARBON 2.7K JA 1/4W	1
R94	401 017 1804	CARBON 2.7K JA 1/4W	1
R95	401 020 2003	CARBON 4.7K JA 1/4W	1
R96	401 012 5708	CARBON 1K JA 1/4W	1
R97	401 021 4105	CARBON 56K JA 1/4W	1
R98	401 017 1804	CARBON 2.7K JA 1/4W	1
R99	401 019 1901	CARBON 3.9K JA 1/4W	1
R100	401 018 5801	CARBON 330K JA 1/4W	1
R101	401 018 4903	CARBON 33K JA 1/4W	1
R102	401 016 4806	CARBON 22K JA 1/4W	1
R103	401 016 4806	CARBON 22K JA 1/4W	1
R104	401 016 5803	CARBON 220K JA 1/4W	1
R105	401 016 4806	CARBON 22K JA 1/4W	1
R106	401 016 4806	CARBON 22K JA 1/4W	1
R107	401 016 5803	CARBON 220K JA 1/4W	1
R108	401 025 8208	CARBON 22K JA 1/6W	1
R109	401 054 8200	OXIDE-MT 100 JA 1/2W	1
R110	401 024 7400	CARBON 10K JA 1/6W	1
R111	401 024 7400	CARBON 10K JA 1/6W	1
R112	401 012 7009	CARBON 10K JA 1/4W	1
R113	401 012 7009	CARBON 10K JA 1/4W	1
R114	401 016 2604	CARBON 220 JA 1/4W	1
R115	401 026 9907	CARBON 4.7K JA 1/6W	1
R116	401 024 7707	CARBON 100K JA 1/6W	1
R117	401 025 8208	CARBON 22K JA 1/6W	1
R118	401 025 8208	CARBON 22K JA 1/6W	1
R119	401 025 8208	CARBON 22K JA 1/6W	1
R120	401 025 8208	CARBON 22K JA 1/6W	1
R121	401 025 8208	CARBON 22K JA 1/6W	1
R122	401 025 8208	CARBON 22K JA 1/6W	1
R123	401 024 7400	CARBON 10K JA 1/6W	1
R124	401 026 4605	CARBON 33K JA 1/6W	1
R125	401 025 8208	CARBON 22K JA 1/6W	1
R126	401 018 3807	CARBON 3.3K JA 1/4W	1
R127	401 024 7400	CARBON 10K JA 1/6W	1
R128	401 012 7009	CARBON 10K JA 1/4W	1
R129	401 012 7009	CARBON 10K JA 1/4W	1
R130	401 012 7009	CARBON 10K JA 1/4W	1
R131	401 012 7009	CARBON 10K JA 1/4W	1
R132	401 012 7009	CARBON 10K JA 1/4W	1
R133	401 012 7009	CARBON 10K JA 1/4W	1
R134	401 012 7009	CARBON 10K JA 1/4W	1
R135	401 012 7009	CARBON 10K JA 1/4W	1
R136	401 012 7009	CARBON 10K JA 1/4W	1
R137	401 012 7009	CARBON 10K JA 1/4W	1
R138	401 018 4903	CARBON 33K JA 1/4W	1
R139	401 018 4903	CARBON 33K JA 1/4W	1
R140	401 018 4903	CARBON 33K JA 1/4W	1
R141	401 018 4903	CARBON 33K JA 1/4W	1
R142	401 018 4903	CARBON 33K JA 1/4W	1
R143	401 018 4903	CARBON 33K JA 1/4W	1
R144	401 018 4903	CARBON 33K JA 1/4W	1
R145	401 018 4903	CARBON 33K JA 1/4W	1
R146	401 018 4903	CARBON 33K JA 1/4W	1
R147	401 018 4903	CARBON 33K JA 1/4W	1
R148	401 018 4903	CARBON 33K JA 1/4W	1
R149	401 018 4903	CARBON 33K JA 1/4W	1
R150	401 018 4903	CARBON 33K JA 1/4W	1
R151	401 018 4903	CARBON 33K JA 1/4W	1
R152	401 018 4903	CARBON 33K JA 1/4W	1
R153	401 018 4903	CARBON 33K JA 1/4W	1
R154	401 026 4605	CARBON 33K JA 1/6W	1
R155	401 026 4605	CARBON 33K JA 1/6W	1
R156	401 026 4605	CARBON 33K JA 1/6W	1
R157	401 026 4605	CARBON 33K JA 1/6W	1
R158	401 024 6700	CARBON 100 JA 1/6W	1
R159	401 024 6700	CARBON 100 JA 1/6W	1
R160	401 024 6700	CARBON 100 JA 1/6W	1
R161	401 024 6700	CARBON 100 JA 1/6W	1
R162	401 012 5708	CARBON 1K JA 1/4W	1
R163	401 012 5708	CARBON 1K JA 1/4W	1
R164	401 012 5708	CARBON 1K JA 1/4W	1
R165	401 024 7004	CARBON 1K JA 1/6W	1
R166	401 012 5708	CARBON 1K JA 1/4W	1
R167	401 012 5708	CARBON 1K JA 1/4W	1
R168	401 012 5708	CARBON 1K JA 1/4W	1
R169	401 012 5708	CARBON 1K JA 1/4W	1
R170	401 012 5708	CARBON 1K JA 1/4W	1

P.C.BOARD PARTS LIST (Continued)

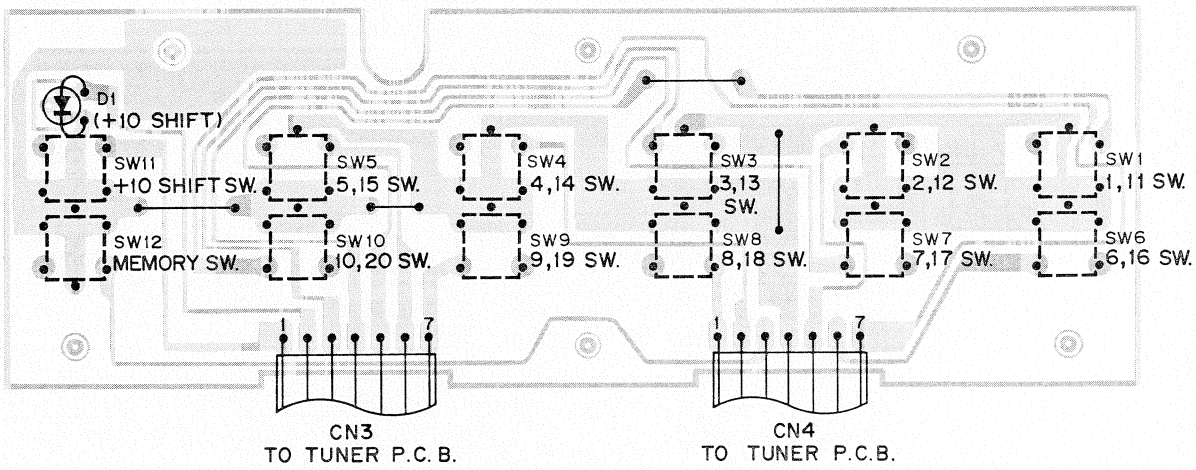
Ref. No.	Part No.	Description	Q'ty
R171	401 012 5708	CARBON 1K JA 1/4W	1
R172	401 012 5708	CARBON 1K JA 1/4W	1
R173	401 012 5708	CARBON 1K JA 1/4W	1
R174	401 012 5708	CARBON 1K JA 1/4W	1
R175	401 012 5708	CARBON 1K JA 1/4W	1
R176	401 026 4605	CARBON 33K JA 1/6W	1
R177	401 025 4606	CARBON 18K JA 1/6W	1
R178	401 025 8703	CARBON 220K JA 1/6W	1
R179	401 027 2600	CARBON 5.6K JA 1/6W	1
R180	401 026 4902	CARBON 330K JA 1/6W	1
R181	401 027 3003	CARBON 56K JA 1/6W	1
R182	401 025 1902	CARBON 15K JA 1/6W	1
R183	401 026 1307	CARBON 27K JA 1/6W	1
R184	401 018 4903	CARBON 33K JA 1/4W	1
R185	401 023 1706	CARBON 820 JA 1/4W	1
R186	401 027 3003	CARBON 56K JA 1/6W	1
R187	401 026 1604	CARBON 270K JA 1/6W	1
R188	401 025 2305	CARBON 150K JA 1/6W	1
R189	401 025 8208	CARBON 22K JA 1/6W	1
R190	401 026 9303	CARBON 47 JA 1/6W	1
R191	401 016 4806	CARBON 22K JA 1/4W	1
R192	401 024 7707	CARBON 100K JA 1/6W	1
R193	401 027 5908	CARBON 68K JA 1/6W	1
R194	401 025 8208	CARBON 22K JA 1/6W	1
R195	401 019 3004	CARBON 39K JA 1/4W	1
R196	401 015 3800	CARBON 18K JA 1/4W	1
R197	401 018 2800	CARBON 330 JA 1/4W	1
R198	401 024 7400	CARBON 10K JA 1/6W	1
R199	401 056 3500	OXIDE-MT 470 JA 1/2W	1
R200	401 018 2404	CARBON 330 JA 1/4W	1
R201	401 018 2800	CARBON 330 JA 1/4W	1
R202	401 063 0301	OXIDE-MT 68 JA 1W	1
R203	401 021 4105	CARBON 56K JA 1/4W	1
R204	401 024 7004	CARBON 1K JA 1/6W	1
	BAND SWITCH P.C.B. ASSY		
26	141-0-1939-17700	Band Switch P.C.B. Assy	1
	4-2262-29460	Band Switch P.C.B.	1
SW1	4-2312-05300	Keyboard Switch 6mm (FM)	1
SW2	4-2312-05300	Keyboard Switch 6mm (MW)	1
SW3	4-2312-05300	Keyboard Switch 6mm (LW)	1
SW4	4-2312-05300	Keyboard Switch 6mm (Manual/Auto)	1
SW5	4-2312-05300	Keyboard Switch 6mm (Mono/Stereo)	1
SW6	4-2312-05300	Keyboard Switch 6mm (Up)	1
SW7	4-2312-05300	Keyboard Switch 6mm (Down)	1
CN1	4-2359-79468	Connector 5P Assy	1
CN2	4-2359-79469	Connector 5P Assy	1
	131-2-4208-46300	Spacer (LED)	1
	SEMICONDUCTOR		
D1	D00--SLP-173B-	L.E.D., SLP 173 B (Mono/Stereo)	1
	PRESET P.C.B. ASSY		
27	141-0-1939-17710	Preset P.C.B. Assy	1
	4-2262-29470	Preset P.C.B.	1
SW1	4-2319-78470	Tact Switch (Station 1, 11)	1
SW2	4-2319-78470	Tact Switch (Station 2, 12)	1
SW3	4-2319-78470	Tact Switch (Station 3, 13)	1
SW4	4-2319-78470	Tact Switch (Station 4, 14)	1
SW5	4-2319-78470	Tact Switch (Station 5, 15)	1
SW6	4-2319-78470	Tact Switch (Station 6, 16)	1
SW7	4-2319-78470	Tact Switch (Station 7, 17)	1
SW8	4-2319-78470	Tact Switch (Station 8, 18)	1
SW9	4-2319-78470	Tact Switch (Station 9, 19)	1
SW10	4-2319-78470	Tact Switch (Station 10, 20)	1
SW11	4-2319-78470	Tact Switch (+10 Shift)	1
SW12	4-2319-78470	Tact Switch (Memory)	1
CN3	4-2359-79467	Connector 7P Assy	1
CN4	4-2359-78774	Connector 7P Assy	1
	SEMICONDUCTOR		
D1	DYY--SLB-22UR-	L.E.D., SLB 22 UR (+10 Shift)	1
	ANTENNA P.C.B. ASSY		
28	141-0-1939-17720	Antenna P.C.B. Assy	1
	4-2262-29480	Antenna P.C.B.	1
L1	4-2539-71850	Choke Coil (470μH)	1
	4-2372-01140	Antenna Terminal 3P (Antenna)	1
	4-2539-71520	Band Pass Filter	1
	CAPACITOR		
C1	CC1-2-0500-JD00C	Ceramic 12pF 50V ±5%	1
	RESISTOR		
R1	401 056 0202	OXIDE-MT 3.3K JA 1/2W	1
	POWER SWITCH P.C.B. ASSY		
29	141-0-1939-17730	Power Switch P.C.B. Assy	1
	4-2262-29490	Power Switch P.C.B.	1
SW1	4-2319-78990	Push Switch 1Key (Power)	1
	METER LED P.C.B. ASSY		
30	141-0-1939-17740	Meter LED P.C.B. Assy	1
	4-2262-29500	Meter LED P.C.B.	1
CN5	131-0-4006-31422	Cord Assy	1
	SEMICONDUCTORS		
D1	4-2029-75050	L.E.D., SLB 24 MG (Signal)	1
D2	4-2029-75050	L.E.D., SLB 24 MG (Signal)	1
D3	4-2029-75050	L.E.D., SLB 24 MG (Signal)	1
D4	4-2029-75050	L.E.D., SLB 24 MG (Signal)	1
D5	4-2029-75050	L.E.D., SLB 24 MG (Signal)	1
D6	4-2029-75060	L.E.D., SLB 24 VR (Stereo)	1
	REMOTE CONTROL INPUT P.C.B. ASSY		
31	141-0-1939-17750	Remote Control Input P.C.B. Assy	1
	4-2262-29510	Remote Control Input P.C.B.	1
	4-2369-75580	Plug 5P (Remote Control)	1
	141-2-3889-04300	Bracket Connect P.C.B.	1

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

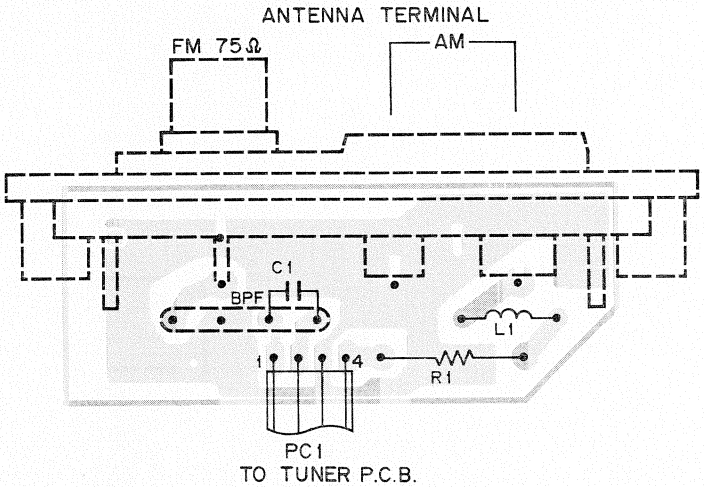
PRESET SWITCH P.C.BOARD

(BOTTOM VIEW)



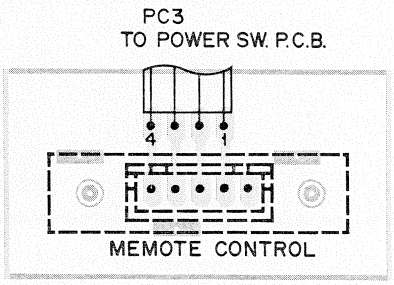
ANTENNA P.C.BOARD

(BOTTOM VIEW)



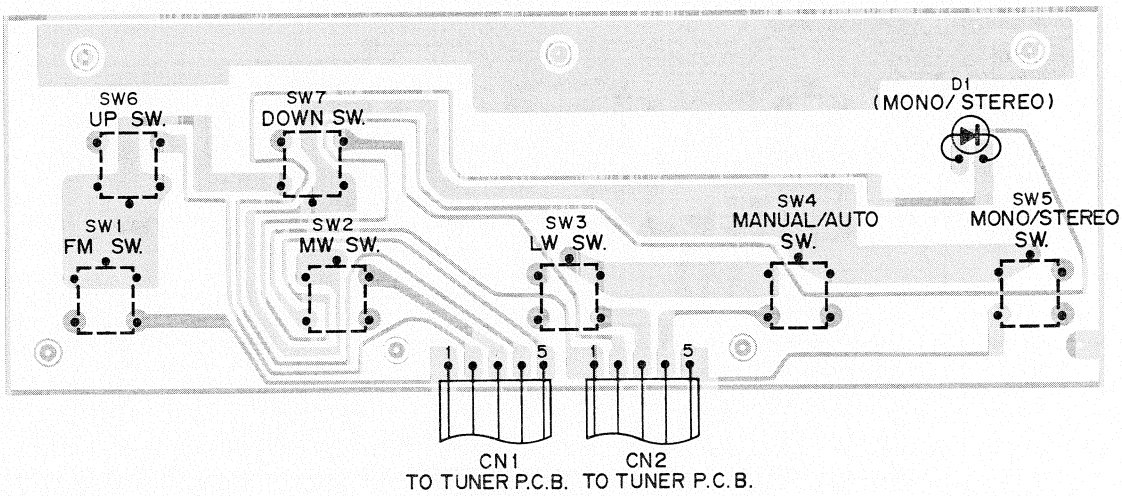
REMOTE CONTROL INPUT P.C.BOARD

(BOTTOM VIEW)



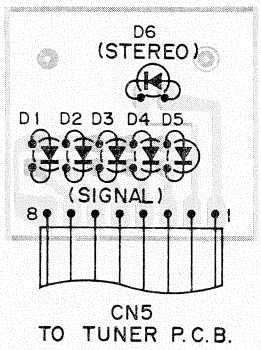
BAND SWITCH P.C.BOARD

(BOTTOM VIEW)



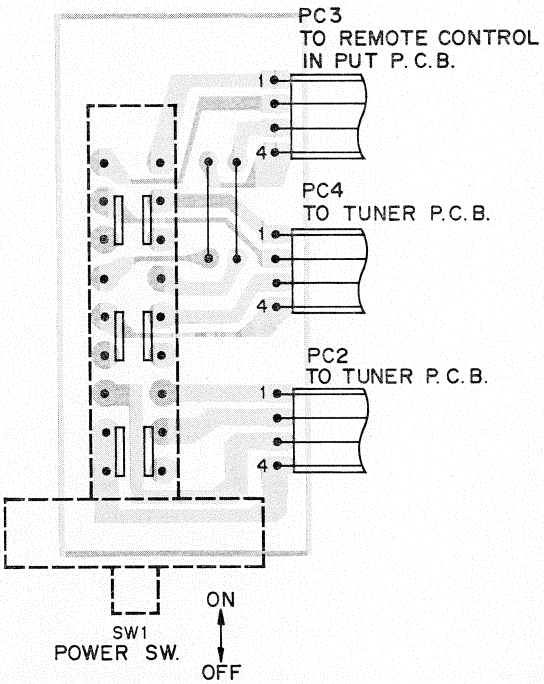
METER LED P.C.BOARD

(BOTTOM VIEW)

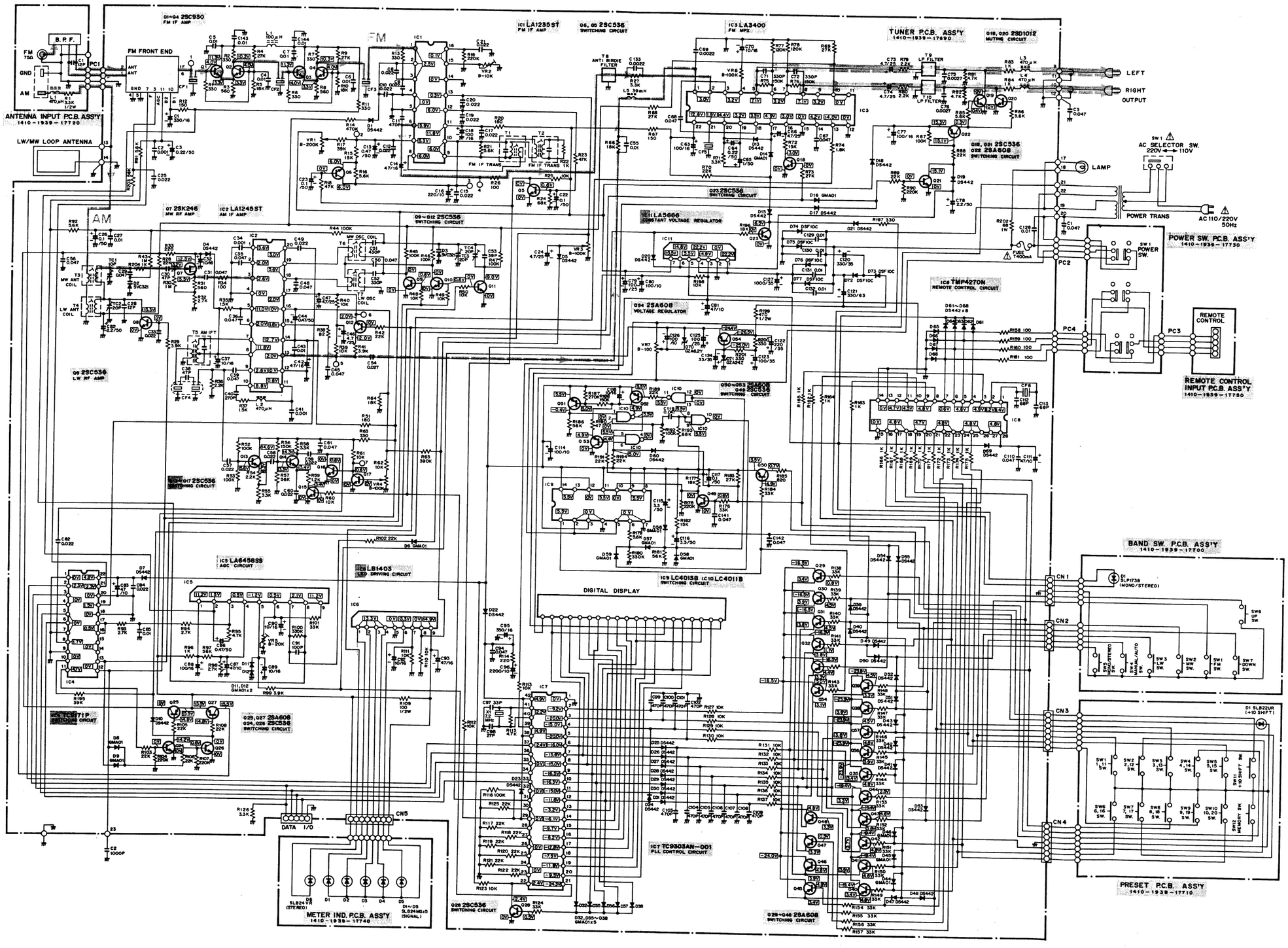


POWER SWITCH P.C.BOARD

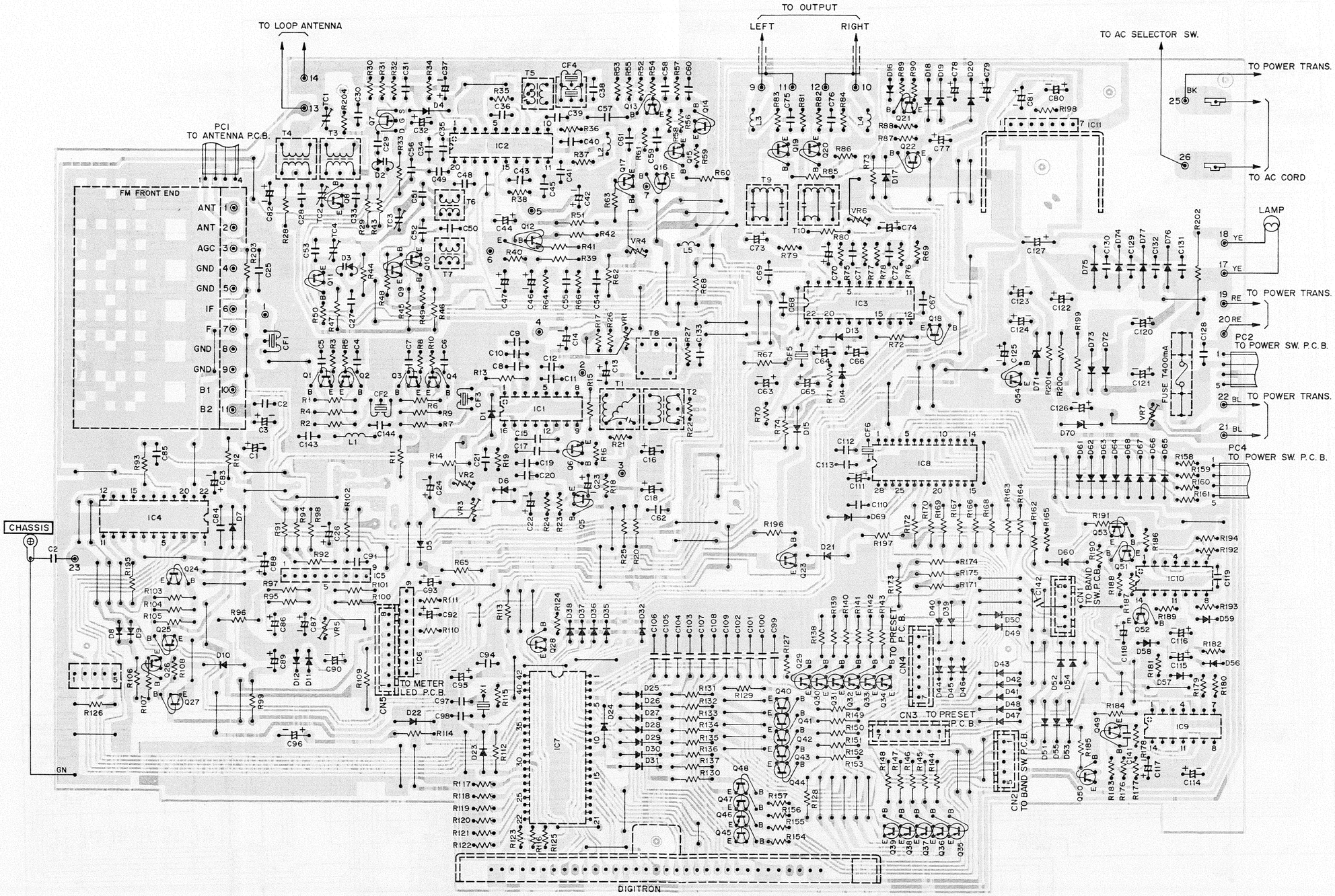
(BOTTOM VIEW)



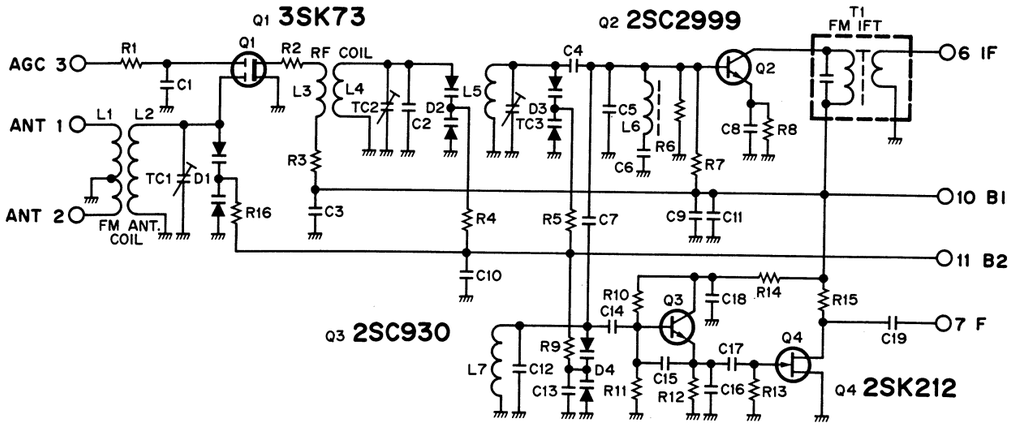
SCHEMATIC DIAGRAM



TUNER PRINTED CIRCUIT BOARD



FRONT END SCHEMATIC DIAGRAM



VOLTAGES TABLE OF TUNER PRINTED CIRCUIT BOARD

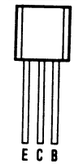
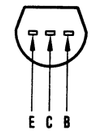
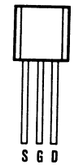
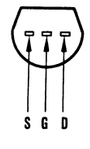
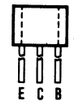
TRANSISTOR DC VOLTAGES

SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E	SYMBOL No.	DEVICE	B	C	E
Q1	2SC 930	4.0V	11.3V	3.3V	Q21	2SC 536	0V	15.1V	0V	Q39	2SA 608	4.5V	−23.9V	3.3V
Q2	2SC 930	4.0V	10.2V	3.3V	Q22	2SA 608	15.1V	0.3V	15.3V	Q40	2SA 608	4.8V	−19.4V	3.4V
Q3	2SC 930	4.0V	11.3V	3.3V	Q23	2SC 536	0V	6.5V	0V	Q41	2SA 608	4.8V	−19.4V	3.9V
Q4	2SC 930	4.0V	10.3V	3.3V	Q24	2SC 536	0V	14.2V	0V	Q42	2SA 608	4.8V	−19.4V	3.7V
Q5	2SC 536	0.6V	0V	0V	Q25	2SA 608	14.8V	0V	15.5V	Q43	2SA 608	4.6V	−19.4V	3.8V
Q6	2SC 536	0V	6.0V	6.0V	Q26	2SC 536	0.6V	0V	0V	Q44	2SA 608	2.5V	−19.4V	3.3V
Q8	2SC 536	0V	15.3V	0V	Q27	2SA 608	14.8V	15.5V	15.5V	Q45	2SA 608	4.8V	−24.0V	3.4V
Q9	2SC 536	0.6V	0V	0V	Q28	2SC 536	0.5V	2.4V	0V	Q46	2SA 608	4.8V	−24.0V	3.9V
Q10	2SC 536	0.6V	0V	0V	Q29	2SA 608	0.8V	−16.5V	3.4V	Q47	2SA 608	0.5V	−24.0V	3.3V
Q11	2SC 536	0V	9.0V	0V	Q30	2SA 608	4.5V	−16.5V	3.9V	Q48	2SA 608	4.8V	−24.0V	3.3V
Q12	2SC 536	0V	2.0V	2.0V	Q31	2SA 608	4.5V	−16.5V	3.8V	Q49	2SC 536	0.6V	0V	0V
Q13	2SC 536	5.6V	14.6V	6.3V	Q32	2SA 608	1.1V	−16.5V	3.8V	Q50	2SA 608	4.9V	0.7V	5.5V
Q14	2SC 536	3.3V	14.3V	3.4V	Q33	2SA 608	4.4V	−16.5V	3.3V	Q51	2SA 608	5.0V	−0.4V	5.5V
Q15	2SC 536	0V	3.4V	0V	Q34	2SA 608	5.0V	−16.5V	3.1V	Q52	2SA 608	5.5V	4.9V	5.5V
Q16	2SC 536	0.6V	0V	0V	Q35	2SA 608	4.8V	−23.9V	3.4V	Q53	2SA 608	4.4V	0V	4.9V
Q17	2SC 536	0V	0.6V	0V	Q36	2SA 608	4.8V	−23.9V	3.9V	Q54	2SA 608	−25.0V	−26.5V	−24.4V
Q18	2SC 536	0V	3.0V	0V	Q37	2SA 608	4.8V	−23.9V	3.8V			G	S	D
Q19, 20	2SD1012	0.4V	0V	0V	Q38	2SA 608	4.5V	−23.9V	3.8V	Q7	2SK 246	3.2V	5.5V	12.5V

IC PIN NUMBERS DC VOLTAGES

SYMBOL No.	DEVICE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
IC1	LA 1235	2.5V	2.5V	2.5V	0V	0V	5.9V	5.3V	6.0V	6.0V	6.0V	11.8V	6.0V	0.3V	0V	0.1V	0.1V				
IC2	LA 1245	5.6V	2.0V	2.6V	0V	11.0V	2.0V	11.8V	11.8V	2.6V	8.8V	0.6V	0V	2.0V	12.7V	1.6V	0V	2.0V	5.6V	5.6V	3.0V
IC3	LA 3400	3.0V	3.0V	3.2V	3.2V	7.1V	3.2V	3.2V	7.1V	3.2V	0V	0V	0V	14.0V	4.2V	0V	3.0V	4.9V	3.5V	3.2V	4.4V
		21	22																		
		1.9V	12.6V																		
IC4	TC 9171P	0V	2.3V	0V	0V	0V	0V	0V	1.7V	0V	0V	4.7V	0V	0V	0V	0V	0.5V	0.5V	0V	1.5V	0V
		21	22																		
		2.3V	4.8V																		
IC5	LA 6458S	11.2V	1.5V	0.5V	0.5V	−1.2V	0.5V	2.1V	2.1V	11.2V											
IC6	LB 1403	13.3V	13.3V	13.3V	13.3V	0V	13.3V	0V	0V	14.9V											
IC7	TC 9303AN	0V	−9.2V	−20.0V	−15.0V	−20.0V	−16.0V	−15.6V	−15.0V	−16.5V	−16.3V	−15.0V	−11.6V	−3.2V	−6.1V	−9.7V	−6.2V	−12.8V	−7.5V	−11.8V	−9.5V
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
		−24.3V	2.4V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	0V	2.4V	4.9V	4.9V	2.2V
		41	42																		
		2.2	4.9																		
IC8	TMP 4270N	1.4V	1.2V	4.9V	4.6V	4.6V	4.6V	0.6V	4.8V	4.8V	4.8V	4.5V	4.7V	0V	0V	0V	4.8V	4.8V	4.8V	4.7V	4.7V
		21	22	23	24	25	26	27	28												
		4.8V	4.8V	4.8V	4.8V	4.8V	4.8V	4.8V	4.8V												
IC9	LC 4013B	5.5V	0V	0V	0V	0V	0V	0V	5.5V	5.5V	0V	5.5V	0V	5.5V	5.5V						
IC10	LC 4011B	0V	0V	5.5V	0V	5.5V	5.0V	0V	5.5V	5.5V	0V	5.5V	0V	0V	5.5V						
IC11	LA 5666	22.2V	0V	4.9V	22.2V	5.5V	14.8V	15.5V													

SEMICONDUCTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA 608 2SC 536 2SC 930		
2SK 246		
2SD 1012		

TERMINAL NAME

B → BASE
C → COLLECTOR
E → EMITTER
S → SOURCE
G → GATE
D → DRAIN

SWITCH NAME & POSITION

No.	Name	Position
Preset P.C.B. Assy		
SW1	STATION 1, 11 Switch	OFF
SW2	STATION 2, 12 Switch	OFF
SW3	STATION 3, 13 Switch	OFF
SW4	STATION 4, 14 Switch	OFF
SW5	STATION 5, 15 Switch	OFF
SW6	STATION 6, 16 Switch	OFF
SW7	STATION 7, 17 Switch	OFF
SW8	STATION 8, 18 Switch	OFF
SW9	STATION 9, 19 Switch	OFF
SW10	STATION 10,20, Switch	OFF
SW11	+10 SHIFT Switch	OFF
SW12	MEMORY Switch	OFF
Band Switch P.C.B. Assy		
SW1	FM Switch	OFF
SW2	MW Switch	OFF
SW3	LW Switch	OFF
SW4	MANUAL/AUTO Switch	AUTO
SW5	MONO/STEREO Switch	STEREO
SW6	UP Switch	OFF
SW7	DOWN Switch	OFF
Power Switch P.C.B. Assy		
SW1	POWER Switch	OFF
SW1	AC SELECTOR Switch	220V

NOTES:
1. All resistors values are indicated in "ohm" (K=10^3, M=10^6).
2. All capacitors values are indicated in "μF" (P=10^{-12}).
3. All voltages indicated on the schematics are measured under the following conditions.
a. Use a V.T.V.M.
b. All voltages ±10 % with respect to chassis ground.
c. FUNCTION SW.: set to "FM" position.
d. No signals at input terminals.
f. AC input at 220 volts 50 Hz.
4. This is a basic schematic diagram.

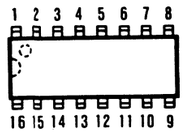
Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

PRODUCT SAFETY NOTICE

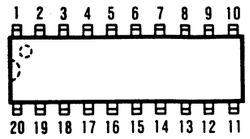
Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

SEMICONDUCTOR LEAD IDENTIFICATION (Continued)

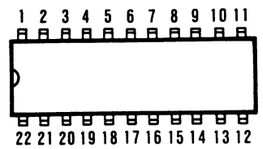
LA 1235 BOTTOM VIEW



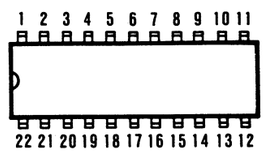
LA 1245 BOTTOM VIEW



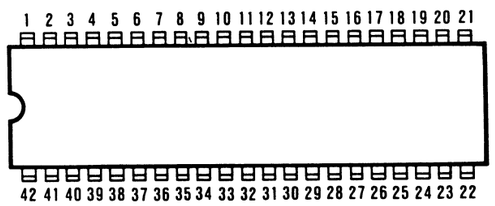
LA 3400 BOTTOM VIEW



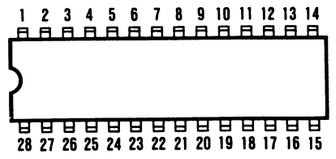
TC 9171P BOTTOM VIEW



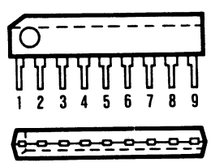
TC 9303 N BOTTOM VIEW



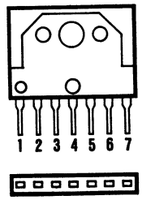
TMP 4270 N BOTTOM VIEW



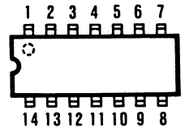
LA 6458 SS / LB 1403 N FRONT/BOTTOM VIEWS



LA 5666 FRONT/BOTTOM VIEWS



LC 4011B/LC4013 BOTTOM VIEWS



FISHER

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- Hi-Fi/Audio –168
- Video –172
- Autoradio –170
- Ersatzteillager –155/156
- Techn. Schulung –174

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Sie sparen so wertvolle Zeit. Vielen Dank.

April/'86/2,000 **Printed in Japan**